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**FINAL DESIGN PACKAGE FOR  
THE FS - 12 PRODUCT RECOVERY SYSTEM**

**VOLUME I  
SPECIFICATIONS**

**MASSACHUSETTS MILITARY RESERVATION  
CAPE COD, MASSACHUSETTS**

**JULY, 1994**



**INSTALLATION RESTORATION PROGRAM**

**FINAL DESIGN PACKAGE FOR  
THE FS-12 PRODUCT RECOVERY SYSTEM**

**VOLUME I**

**MASSACHUSETTS MILITARY RESERVATION  
CAPE COD, MASSACHUSETTS**

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for the U.S. Department of Energy  
under Contract DE-AC05-84OR21400**

**JULY 1994**

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**DIVISION 0**  
**BIDDING AND CONTRACT REQUIREMENTS**

**SECTION 00100**  
**INSTRUCTIONS TO BIDDERS**

1. The general location of the remedial action work described in this specification is on the east side of the Massachusetts Military Reservation (MMR) (see Drawings for location details). The existing contamination is believed to have come from the fuel transfer pipeline along Greenway Road.

This project involves the installation, operation, and maintenance of a combined soil vapor extraction/air sparging system. The scope of work is, but not necessarily limited to:

- installation of twenty-one (21) vapor extraction wells and twenty-two (22) air sparging wells, including grubbing and clearing requirements
  - procurement and installation of a soil vapor extraction system including: blower, air/water separator, and air pollution control system
  - procurement and installation of an air sparging system including a compressor and an automated control system to allow time-phased operation
  - construction of a treatment building to house major system equipment, controls, and monitoring devices
  - provide work as described in Section 01010, Summary of Work
  - procurement and installation of the safety devices and other necessary items to ensure the safe and reliable operation of the soil vapor extraction system, air sparging system, and air pollution control system
  - provide for all necessary permits, manifests, and licenses
  - transportation, treatment and/or disposal of all solid and liquid wastes generated during installation and operation of the system, in accordance with federal, state, and local regulations
  - operation and maintenance of the combined soil vapor extraction/air sparging system for a period of 2 years with options of additional 90-day periods.
  - installation of approximately 1300 linear feet of chain link fence along the MMR property line, southwest of the remedial site.
2. It is the responsibility of the Bidder to read and become completely familiar with all information contained in this Invitation for Bids.
  3. The specifications contained herein are intended to give a general description of the work required, and may not provide extremely detailed descriptions of all conditions to be encountered during the installation and operation of the combined soil vapor extraction/air sparging system. The specifications address the successful completion of the work specified, whether every detail is specifically mentioned or not.
  4. During the operational period of the system, the Contractor shall provide for a technician or subcontractor(s) on-site to adequately monitor system performance, manage all

operations and maintenance activities, provide reports to the MMR Installation Restoration Program (IRP) office, Environmental Protection Agency (EPA), and the Massachusetts Department of Environmental Protection (MADEP), and conduct sampling and analysis of wastewater and air emissions as discussed in the specifications.

5. Representatives of the MMR IRP office shall be present during site activities. It is required that activities included in the Plans and Specifications for system installation commence within 10 business days after final approval of applicable submittals listed in Section 01300.
6. The lump sum and unit bid prices are to include all costs for completing the services described herein, including, but not limited to: mobilization and demobilization, standby time, equipment, materials, supplies, direct labor, operation, maintenance, per diem, overhead, fringe, insurance, bond fees, profit, compliance with applicable health and safety and quality assurance/quality control requirements, waste characterization, transportation, treatment and/or disposal, permits, and manifests, and sequencing as defined herein.
7. Although the bid costs submitted shall be used during the bid evaluation, payment shall be based on lump sum for the items specified and on actual measured quantities of each item furnished by the Contractor, times the unit price bid for the remaining items.

**\*\*\* END OF SECTION 00100 - INSTRUCTIONS TO BIDDERS \*\*\***

## SECTION 00120

### ACRONYMS AND ABBREVIATIONS

#### PART 1 - GENERAL

##### 1.01 DESCRIPTION

This section specifies the definition of acronyms and abbreviations used herein.

##### 1.02 ACRONYMS AND ABBREVIATIONS

|          |  |
|----------|--|
| AA       | Aluminum Association   |
| AGMA     | American Gear Manufacturers Association  |
| AISC     | American Institute of Steel Construction   |
| AISI     | American Iron and Steel Institute  |
| AMCA     | Air Moving and Conditioning Association, Inc.  |
| ANSI     | American National Standards Institute  |
| APCU     | Air Pollution Control Unit   |
| ASHRAE   | American Society of Heating, Refrigerating and Air<br>Conditioning Engineers                 |
| ASME     | American Society of Mechanical Engineers   |
| ASTM     | American Society for Testing of Materials  |
| AWS      | American Welding Society   |
| AWWA     | American Water Works Association   |
| BOCA     | Basic Building Code  |
| BTEX     | benzene, toluene, ethylbenzene, and xylenes  |
| CAA      | Clean Air Act  |
| CERCLA   | Comprehensive Environmental Response, Compensation, and Liability<br>Act of 1980 (Superfund) |
| CFR      | Code of Federal Regulations  |
| CMR      | Code of Massachusetts Regulations  |
| CO       | Contracting Officer  |
| COR      | Contracting Officer's Representative   |
| cu. yds. | cubic yards  |
| CWA      | Clean Water Act  |
| DOT      | U.S Department of Transportation   |
| EDB      | ethylene dibromide   |
| EPA      | United States Environmental Protection Agency  |
| FM/IRI   | Factory Mutual/Industrial Research Institute   |
| ft       | foot   |
| gals     | gallons  |
| gpm      | gallons per minute   |
| IEEE     | Institute of Electrical and Electronic Engineers   |



|        |  |
|--------|--|
| IRP    | Installation Restoration Program                     |
| LEL    | Lower Explosive Level                                |
| MADEP  | Massachusetts Department of Environmental Protection |
| MBMA   | Metal Building Manufacturer's Association            |
| MGL    | Massachusetts General Law                            |
| MMR    | Massachusetts Military Reservation                   |
| MMBTU  | One million British Thermal Units                    |
| mph    | miles per hour                                       |
| NAAQS  | National Ambient Air Quality Standards               |
| NBFU   | National Board of Fire Underwriters                  |
| NCP    | National Contingency Plan                            |
| NEC    | National Electric Code                               |
| NEMA   | National Electrical Manufacturers Association        |
| NFPA   | National Fire Protection Association                 |
| NMHC   | non-methane hydrocarbon                              |
| NPDES  | National Pollutant Discharge Elimination System      |
| OSHA   | Occupational Safety and Health Administration        |
| OVM    | organic vapor meter                                  |
| PID    | photoionization detector                             |
| PLC    | programmable logic controller                        |
| POTW   | publicly owned treatment works                       |
| psf    | pounds per square foot                               |
| psi    | pounds per square inch                               |
| psig   | pounds per square inch, gage                         |
| PVC    | polyvinyl chloride                                   |
| RCRA   | Resource Conservation and Recovery Act               |
| SARA   | Superfund Amendment and Reauthorization Act          |
| SCFM   | standard cubic feet per minute                       |
| SHSO   | Site Health and Safety Officer                       |
| sq. ft | square foot  |
| SS     | stainless steel                                      |
| SSPC   | Structural Steel Painting Council                    |
| TPH    | Total Petroleum Hydrocarbons                         |
| UL     | Underwriter's Laboratories, Inc.                     |
| VOC    | Volatile Organic Compounds                           |

## PART 2 - PRODUCTS

Not applicable to this section.

PART 3 - EXECUTION

Not applicable to this section.

**\*\*\* END OF SECTION 00120 - ACRONYMS AND ABBREVIATIONS \*\*\***

## SECTION 00200 SITE CONDITIONS

### PART 1 - GENERAL

#### 1.01 DESCRIPTION

This section discusses information on site conditions at the installation.

#### 1.02 INFORMATION ON SITE CONDITIONS

- A. Any information obtained by the Government regarding site conditions, subsurface information, groundwater elevations, existing construction of site facilities as applicable, and similar data shall be available for inspection at the MMR IRP office upon request. Such information is offered as supplementary information only. The government does not assume any responsibility for the completeness, accuracy, or interpretation of such supplementary information.
- B. Before starting work, the Contractor shall locate all base-owned and public utilities at the site. The Contractor shall use all available measures to verify the actual field location of utilities, including hand excavation and exploratory excavations prior to commencing site work. Where utility lines or structures on MMR are encountered, the Contractor shall report them to the MMR Contracting Officer (CO) or designee Contracting Officer Representative (COR) before proceeding with the work.
- C. Utility lines and structures are to remain in service and shall be protected by the Contractor from any damage as a result of his operations. The Contractor shall locate all utilities by appropriate measures and shall bear the cost of repair or replacement of any utility lines or structures broken or damaged by these operations.

#### 1.03 PROTECTION OF LANDSCAPE FEATURES, WORK, AND STRUCTURES

- A. Landscapes: Trees, shrubs, grass, or other growth designated to remain in place or outside of the limits of work, are to be protected during the accomplishment of the work and are not to be damaged in any manner. Such growth damaged by the Contractor is to be repaired, as directed, at no cost to the government. Lawn surfaces, embankments, cut slopes, ditches, or other surfaces disturbed by the Contractor are to be regraded to the original grade, and the grass or lawn surface replaced in kind, at no additional cost to the government.
- B. Structures: Structures outside of the limits of work or designated to remain in place are to be protected by the Contractor during the progress of work. Any structure damaged in any manner is to be repaired or restored to its original condition as directed by the MMR CO or designee (COR) and at no cost to the government. Pavement is to be replaced in kind, in accordance with the applicable section of specifications or as directed by the MMR CO or designee (COR).

PART 2 - PRODUCTS

Not applicable to this section.

PART 3 - EXECUTION

Not applicable to this section.

**\*\*\* END OF SECTION 00200 - SITE CONDITIONS \*\*\***

**SECTION 00860  
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**\*\*\* END OF SECTION 00860 - LIST OF DRAWINGS \*\*\***

**DIVISION 1**  
**GENERAL REQUIREMENTS**

## SECTION 01010 SUMMARY OF WORK

### PART 1 - GENERAL

#### 1.01 DESCRIPTION

- A. The work includes the installation of a combined soil vapor extraction/air sparging system, the air pollution control equipment, and other associated equipment and activities as specified herein.
- B. As specified herein, the Contractor shall furnish all labor, materials, equipment, temporary offices, facilities, and utilities to perform (at minimum, but not limited to) the following:
  - 1. Install twenty-one (21) vapor extraction wells as specified herein.
  - 2. Install twenty-two (22) air sparging wells as specified herein.
  - 3. Construct a treatment/control building to house major system equipment, controls, and monitoring devices.
  - 4. Grub and clear areas as defined by clearing limits on Drawings.
  - 5. Extend the extraction wells approximately 100ft below grade and screen the lowest 30ft section with stainless steel screen. Extend the air sparging wells approximately 160ft below grade and screen the lowest 10ft section with stainless steel screen.
  - 6. Properly dispose of soil cuttings, development water, and decontamination fluids generated as a result of the well installation activities.
  - 7. Install vapor extraction headers and collection piping as specified herein.
  - 8. Install air sparging headers and distribution piping as specified herein.
  - 9. Procure and install the combined soil vapor extraction/air sparging system as specified herein and on the attached Drawings. This system will include the blower, air/water separator, air pollution equipment, air compressor, and all necessary controls, valves, switches, gauges, etc.
  - 10. Provide the wiring and appropriate electrical equipment to operate the soil vapor extraction and air sparging systems.
  - 11. Provide the personnel, utilities, and the required spare parts to test, operate, and maintain the soil vapor extraction and air sparging systems for the duration of the remedial effort (for 24 months with options of additional 90-day periods).
  - 12. Provide a health and safety plan meeting the requirements specified herein.
  - 13. Provide a Remedial Action Work Plan.
  - 14. Provide a Contractor Quality Control Plan that will control all of the construction, testing, operation, maintenance, sampling and analysis activities.
  - 15. Restore all work areas as specified herein.
  - 16. Provide for all necessary permits, manifests, and licenses.
  - 17. Provide all necessary utility connections and utility extensions.
  - 18. Provide the propane or natural gas supply for the catalytic oxidation system.

19. Provide any other necessary items or services required to successfully complete the soil vapor extraction and air sparging systems construction and operation.
20. Provide protection around any exposed piping or equipment.
21. Clear, grub, and install boundary fence as shown on the Drawings.
22. Incidental work items such as:
  - A. Clearing, grubbing, and stripping
  - B. Equipment decontamination
  - C. Dewatering
  - D. Clean-up
  - E. Warning signs, barricades, and warning lights
  - F. Cooperation with other Contractors and others
  - G. Utility crossings and locations, unless otherwise paid for
  - H. Minor items such as replacement of fences, guard rails, etc.
  - I. Steel and/or wood sheeting, as required, including that left in place
  - J. Temporary facilities
  - K. Mobilization and demobilization of equipment
  - L. Providing the services of the manufacturer's factory trained representative for adjustments, testing, and instruction of operating personnel
  - M. Survey and land activities
  - N. Dust control

#### 1.02 SEQUENCING OF WORK

The Contractor shall complete and shall be responsible for scheduling the work in order to complete the work within the time established in the Contract.

#### PART 2 - PRODUCTS

Not applicable to this section.

#### PART 3 - EXECUTION

Not applicable to this section.

**\*\*\* END OF SECTION 01010 - SUMMARY OF WORK \*\*\***



## SECTION 01060 REGULATORY REQUIREMENTS

### PART 1 - GENERAL

#### 1.01 DESCRIPTION

This section discusses the regulatory requirements to be followed in performing the work specified herein. Section 120 of CERCLA requires that Federal facilities be subject to and comply with the provisions of CERCLA, both procedural and substantive. CERCLA, as amended by the Superfund Amendment and Reauthorization Act (SARA) and the National Contingency Plan (NCP) requires that remedial actions attain applicable or relevant and appropriate requirements to the greatest extent practicable.

#### 1.02 REGULATORY REQUIREMENTS

The Contractor shall conduct all work specified herein and all associated work necessary to complete the task in accordance with all federal, state and local ordinances, codes, regulations, and guidance including, but not limited to, those of the USEPA and the MADEP. Should any regulation, code, or ordinance conflict with that of another agency or requirement specified herein, the more stringent regulation, code, ordinance, or requirement shall govern.

- A. For on-site activities the following regulations promulgated under the Resource Conservation and Recovery Act (RCRA), Clean Air Act (CAA), Occupational Safety and Health Act (OSHA) and the Code of Massachusetts Regulations (CMR) will be applicable:
  - 1. OSHA - Occupational Health and Safety Standards (29 CFR Part 1910)
  - 2. OSHA - Recordkeeping and Reporting (29 CFR 1904)
  - 3. OSHA - General Industry Standards (29 CFR 1926)
  - 4. CAA - National Ambient Air Quality Standards (NAAQS)
  - 5. Ambient Air Quality Standards (310 CMR 6.00)
  - 6. Air Pollution Control Regulations (310CMR 7.00)
  - 7. Clean Water Act (CWA) - National Pollution Discharge Elimination System (NPDES) Discharge Requirements (40 CFR Part 122)
  - 8. Massachusetts Implementation of Massachusetts General Law (MGL), Chapter 111f, Employee and Community Right-to-Know (310 CMR 33.00)
  - 9. Massachusetts Worker Right-to-Know (441 CMR 21.00)
  - 10. MGL, Chapter 21E, Massachusetts Contingency Plan
  - 11. Massachusetts Drinking Water Regulations (310 CMR 22.00)
- B. Waste/Material transportation regulations will include, but not be limited to:
  - 1. Department of Transportation (DOT), Rules for the Transportation of Hazardous Materials (49 CFR Section 171).

C. Regulations applicable to off-site treatment and disposal of hazardous wastes, if required, will include but not necessarily be limited to the following:

1. RCRA - Hazardous Waste Management (40 CFR Part 264)
2. RCRA - Land Disposal Restrictions (40 CFR , Part 268)

## PART 2 - PRODUCTS

Not applicable to this section.

## PART 3 - EXECUTION

Not applicable to this section.

**\*\*\* END OF SECTION 01060 - REGULATORY REQUIREMENTS \*\*\***

## SECTION 01122 PERMITS AND CLEARANCES

### PART 1 - GENERAL

#### 1.01 DESCRIPTION

The Contractor is responsible for obtaining all permits and clearances, including permits from the Commonwealth of Massachusetts and the MADEP.

The following is a list of potentially required permits and clearances for the installation and operation of the remedial system:

1. Categorical approval from the MADEP under the provisions of 310 CMR 7.00 for the emissions from "aeration" remedial systems that emit over one ton/year of air contaminants.
2. License to utilize a specified system that is patented.
3. Approval of construction plans and activities by Base Civil Engineering

#### 1.02 RESPONSIBILITY OF THE BASE CO AND CONTRACTOR

- A. The Contractor shall be held responsible for preparing all appropriate federal, state or local permits and manifests (to include the Massachusetts Uniform Hazardous Waste Manifest) or shipping paper to handle, dispose of, treat and/or transport, as a minimum, but not limited to, any wastewater generated during well development activities, drill cuttings, or other wastes generated during the installation and operation of the remedial system.
- B. The Contractor shall be responsible for obtaining the necessary digging and gunnery range clearances from Base personnel. The Contractor shall not excavate in any area until clearances have been obtained and utilities have been flagged and marked. The principle clearances required will be from the DIG SAFE Corporation and a digging permit from the Base Civil Engineer. The Contractor shall use all available measures to verify the actual field location of utilities including hand excavation and exploratory excavations.
- C. The Contractor is required to provide the MMR CO or designee (COR) with information on the names and social security numbers of all personnel including any subcontractor(s) entering the installation, the purpose of the personnel at the installation, dates they shall be on the installation, and any other information required for the MMR CO or designee (COR) to obtain entrance permits for Contractor personnel.
- D. The MMR CO or designee (COR) is responsible for obtaining entrance permits with the information from C above. The Contractor shall provide entrance permit information to the MMR CO or designee (COR) 10 working days prior to entering the

installation. The permits must accompany Contractor or subcontractor(s) personnel at all times while on base and must be shown upon each entry to the installation.

### 1.03 SUBMITTALS

The Contractor shall submit all necessary permits, manifests, and licenses to perform the work specified herein. The MMR CO or his designee (COR) shall sign manifest forms and other forms as appropriate. The Contractor shall submit information to the MMR CO or designee (COR) as specified above.

### PART 2 - PRODUCTS

Not applicable to this section.

### PART 3 - EXECUTION

Not applicable to this section.

**\*\*\* END OF SECTION 01122 - PERMITS AND CLEARANCES \*\*\***

**SECTION 01125  
SPECIAL PROJECT PROCEDURES**

**PART 1 - GENERAL**

**1.01 DESCRIPTION**

- A. Special project plans and procedures are required of the Contractor to implement installation, testing, operation, and maintenance activities for the combined soil vapor extraction/air sparging system in accordance with applicable federal, state, and local regulations. These include the following plans and procedures:
  - 1. Remedial Action Work Plan
  - 2. Quality Assurance/Quality Control Plan
  - 3. Health and Safety Plan
- B. These procedures shall satisfy all applicable Federal, State, and Local regulations.
- C. Contractor is required to certify that Contractor's employees are properly trained to perform the work required by this contract prior to commencement of any site work.

**1.02 SUBMITTALS PRIOR TO MOBILIZATION**

- A. Remedial Action Work, Quality Assurance/Quality Control, and Health and Safety Plans:
  - 1. Submit plans for implementing these procedures for approval to the MMR CO or designee (COR), and for review and comment to the EPA and the MADEP. No work on-site will be permitted until the comments received from the regulatory agencies are adequately addressed by the Contractor and the plans are approved by the MMR CO or designee (COR). Time allotted for submitting, reviewing, and approving the Plans shall be as shown in the Contract Conditions. Time allotted for plan review shall be no less than 140 days. The Contractor will be given no extension in time for delays caused by the Contractor's failure to address all comments adequately in a second submittal.
  - 2. The approved plans, complete with all comments addressed, shall be made a part of the Contract Documents by reference. The Contractor shall implement and maintain these procedures at the appropriate time prior to and during performance of the work. Failure to adhere to these plans will give the MMR CO or designee (COR) the right to issue a stop work order. The Contractor shall not be entitled to a time extension for such an action.
- B. Contractor's Certification: Certify in writing to the MMR CO or designee (COR) prior to beginning work that employees working pursuant to this Contract are properly trained for this type of work and that training, as a minimum, is in compliance with OSHA 1910.120. Certification of baseline/annual physical or appropriate medical surveillance program for all on-site employees shall be submitted to the MMR CO or designee (COR).

- C. A roster of trained personnel shall be provided to the MMR CO or designee (COR).

## PART 2 - PRODUCTS

Not applicable to this section.

## PART 3 - EXECUTION

### 3.01 REMEDIAL ACTION WORK PLAN

- A. Prepared a Remedial Action Work Plan which will be the basis for the Contractor's approach to the implementation of the designed Remedial Action. This plan should show the Contractor's complete concept and approach, with appropriate detail for the construction and accomplishment of work. The Remedial Action Work Plan shall as a minimum address the following:
  - 1. Tentative formulation of the Remedial Action Team, including the key personnel, descriptions of duties, and lines of authority in the management of the construction activities.
  - 2. Description of the role of the Contractor, and the relationship between the Contractor and the MMR CO or designee (COR), the Contractor's independent quality assurance team, and the remedial action subcontractors.
  - 3. Process for selection of the remedial action subcontractors.
  - 4. Schedule for the remedial action and the process to continuously update the project schedule.
  - 5. Operation and maintenance requirements and procedures.
  - 6. Provisions for clean up of any spills that may occur during installation, testing, operation, and maintenance of the combined soil vapor extraction/air sparging system.
  - 7. Sampling and analysis strategy to verify specified performance requirements during system operation.
  - 8. Waste transportation, treatment, and/or disposal strategy.
  - 9. Requirements for project closeout.

### 3.02 HEALTH AND SAFETY PLAN

- A. Prepare a Health and Safety Plan detailing health and safety procedures for work associated with the installation, testing, operation, and maintenance of a combined soil vapor extraction/air sparging system.
- B. The Health and Safety Plan shall conform to the requirements of 20 CFR 1910 which includes but is not limited to the following:
  - 1. The name of a site health and safety officer (SHSO) and the names of key personnel and alternates responsible for site safety and health.

2. A health and safety risk analysis for existing site conditions, and for each site task and operation.
  3. Employee training assignments.
  4. A description of personal protective equipment to be used by employees for each of the site tasks and operations being conducted.
  5. Medical surveillance requirements.
  6. A description of the frequency and types of air monitoring, personnel monitoring, and environmental sampling techniques and instrumentation to be used.
  7. Site control measures.
  8. Decontamination procedures.
  9. A contingency plan that meets the requirements of 29 CFR 1910.120.
  10. A roster of trained and certified personnel allowed on site.
- C. A monitoring program shall be required to indicate conformance to the approved Health and Safety Plan as required by 29 CFR 1910.120.

### 3.03 QUALITY ASSURANCE/QUALITY CONTROL PLAN

The Contractor's Quality Control Plan shall include standard industry quality control/quality assurance requirements to assure quality installation, testing, operation, and maintenance of the combined soil vapor extraction/air sparging system.

### 3.04 CONTRACTOR'S CERTIFICATIONS

- A. Certify in writing that all employees working pursuant to this contract are properly trained for this type of work.
- B. This certification shall state that:
1. All employees are current in their training for that level required by their job function and responsibility, as required by SARA Section 126(b)(2), and 29 CFR part 1910.
  2. The individual who signs the certification of training on behalf of the Contractor has the Contractor's authority to certify that this training information is accurate and complete.
  3. The Contractor agrees to abide by all applicable federal, state, and local laws and regulations regarding removal, storage and disposal of hazardous waste done pursuant to or in conjunction with this contract.
  4. The Contractor's quality control manager is required to be a qualified hazardous material manager/engineer or comparable individual with a minimum of two years of remedial experience, at the project manager, project engineer, superintendent or QC manager level.
  5. The Contractor's project manager is required to be a qualified hazardous material manager/engineer or comparable individual with a minimum of two years of remedial experience at the project manager level.
  6. The Contractor's SHSO is required to have a minimum of 2 years hazardous waste experience or training, with a minimum of 30 days or more hazardous waste

field experience. The SHSO is required to be trained at least one level of protection above the highest level anticipated for the site; to have completed eight hours health and safety supervisory training; to be first aid/CPR (cardiopulmonary resuscitation) certified, and to be otherwise compliant with 29 CFR 1910.120

**\*\*\* END OF SECTION 01125 - SPECIAL PROJECT PROCEDURES \*\*\***



## **SECTION 01200 PROJECT MEETINGS**

### **PART 1 - GENERAL**

#### **1.01 DESCRIPTION**

This section covers the requirements for project meetings and is supplementary to the meeting requirements of the Conditions of the Contract.

#### **1.02 ATTENDEES**

Unless otherwise specified or required by the MMR CO or designee (COR), all project meetings shall be attended by the MMR CO or designee (COR), the Contractor, and the Contractor's superintendent. Subcontractors may attend when involved in the matters to be discussed or resolved but only when requested by the MMR CO or designee (COR) or the Contractor.

#### **1.03 MEETINGS**

The Contractor shall record minutes of each project meeting and shall furnish copies to the MMR CO or designee (COR) within five working days after the meeting. If the MMR CO or designee (COR) does not submit written objection to the contents of such minutes within seven days after submittal to him, it shall be understood and agreed that the MMR Co or designee (COR) accepts the minutes as a true and complete record of the meeting.

#### **1.04 MEETING SCHEDULE**

The dates, times, and locations for the various meetings shall be agreed upon and recorded at the preconstruction conference. Thereafter, changes to the schedule shall be by agreement between MMR CO or designee (COR) and the Contractor, with appropriate written notice to all parties involved.

### **PART 2 - PRODUCTS**

Not applicable to this section.

## PART 3 - EXECUTION

### 3.01 PRECONSTRUCTION CONFERENCE

- A. Prior to issuance of the Notice to Proceed, a preconstruction conference shall be held at the location, date, and time designated by the MMR CO or designee (COR). In addition to the attendees named herein, the meeting shall be attended by the representatives of regulatory agencies having jurisdiction of the Project, if required, and such other persons the MMR CO or designee (COR) may designate.
- B. Agenda: In general, the matters to be discussed or resolved and the instructions and information to be furnished to or given by the Contractor at the preconstruction conference include:
  - 1. construction schedule;
  - 2. project meeting schedule;
  - 3. progress schedule and schedule of values submitted by Contractor;
  - 4. communication procedures between the parties;
  - 5. the names and titles of all persons authorized by the Contractor to represent and execute documents for him, with samples of all authorized signatures;
  - 6. the name, addresses, and telephone numbers of all those authorized by the Contractor to act for him in emergencies;
  - 7. health and safety and quality assurance/quality control requirements;
  - 8. public notice of starting work;
  - 9. forms and procedures for Contractor's submittals;
  - 10. Change Order forms and procedures;
  - 11. payment application forms and procedures and the revised progress schedule reports to accompany the applications;
  - 12. Contractor's provisions for barricades, traffic control, utilities, sanitary facilities, and other temporary facilities and controls;
  - 13. confirmation of construction equipment and methods proposed by the Contractor;
  - 14. issuance of the Notice to Proceed;
  - 15. other administrative and general matters as needed.

### 3.02 PROJECT MEETINGS

As stipulated in the project meeting schedule submitted at the pre-construction conference, project meetings shall be held to discuss project progress, schedule modifications, change orders, and other pertinent issues.

### 3.03 SPECIAL MEETINGS

Upon appropriate notice to other parties, special meetings may be called by the MMR CO or designee (COR) or Contractor.

### 3.04 POST-CONSTRUCTION CONFERENCE

A post-construction conference shall be held prior to final inspection of the work to discuss and resolve all unsettled matters. The bonds and insurance to remain in force, and the other documents required by the Contractor shall be reviewed and any deficiencies determined. Schedules and procedures for the final inspection process, and for the correction of defects and deficiencies, shall be discussed and agreed.

**\*\*\*END OF SECTION 01200 - PROJECT MEETINGS\*\*\***

## SECTION 01300 SUBMITTALS

### PART 1 - GENERAL

#### 1.01 DESCRIPTION

This section covers requirements for submittals and forms as part of all other specification sections in which submittals are specified or required. Refer to the specific sections and divisions of the specifications for additional submittal requirements.

##### Submittal Requirements

1. Remedial Action Work Plan;
2. Health and Safety Plan;
3. Quality Assurance/Quality Control Plan;
4. Daily Records;
5. Monthly reports;
6. Photographs and/or videotapes;
7. Transportation, treatment, and/or disposal manifests;
8. As-built drawings of final system configuration;
9. Equipment data including manufacturer drawings and schematics, recommended operating conditions, power requirements, anchorage details, and complete instructions for installation, operation, and maintenance.
10. Manufacturer's certificates.
11. Shop drawings for treatment building.

### PART 2 - PRODUCTS

Not applicable to this section.

### PART 3 - EXECUTION

#### 3.01 SUBMITTAL - GENERAL REQUIREMENTS

The Contractor shall submit to the MMR CO or designee (COR) for his review and approval six copies of submittals required by the contract documents or subsequently required by modifications. Submittals and their contents shall be properly prepared, identified, and transmitted as provided herein or as the MMR CO or designee (COR) may otherwise direct. A list of required submittals will be provided to the Contractor at the preconstruction conference.

- A. Submittal Review Time: Unless stated otherwise for a specific item herein, not less than 14 days shall be allowed for the review of submittals. Extension of the contract time shall not be granted because of the Contractor's failure to make timely and correctly prepared submittals, as well as allowances for the checking and review periods.
- B. Deviations: At the time of the submission, the Contractor shall give notice in writing of any deviation from the requirements of the contract documents. The deviations shall be clearly described including all other changes required to correlate the work.
- C. Method of Submittal: The Contractor shall deliver submittals by means of dated, signed, and sequence-numbered transmittals identifying them as to initial or resubmittal status. Submittals are not acceptable directly from subcontractors, suppliers, or manufacturers.
- D. Contractors Review and Approval: Every submittal shall bear the Contractor's review and approval stamp certifying that he 1) has reviewed, checked, and approved the submittal and has coordinated the contents with the requirements of the work and the contract documents; and 2) has determined and verified all quantities, field measurements, field construction criteria, materials, equipment, catalog numbers, and similar data.
- E. CO Review and Approval: The approval of submittals shall not relieve the Contractor of responsibility for any deviation from the requirements of the contract documents. In addition, no approval shall relieve the Contractor of responsibility for errors or omissions in the submittals or for the accuracy of dimensions and quantities.
- F. Corrections and Resubmittals: The Contractor shall make all required corrections and shall resubmit the required number of corrected submittals until approved by the MMR CO or designee (COR).
- G. Check of Returned Submittals: The Contractor shall check submittals returned to him for correction and ascertain if the corrections result in extra cost to him above that included under the Contract Documents, and shall give written notice to the government within five days if, in his opinion, such extra cost result from corrections. By failing to so notify the government or by starting any work covered by a submittal, the Contractor waives all claims for extra costs resulting from required corrections.

### 3.02 DAILY RECORDS

The Contractor shall maintain a field notebook to record data and observations covering both the Contractor's and all subcontractors' activities. Entries shall be described in as much detail as necessary so that anyone referring to individual activity, construction, operation, or location can reconstruct an accurate description of a particular situation without reliance on memory.

The field notebook shall be bound and prepared in waterproof black ink, and may contain a variety of information including the date, start, and finish time, weather, the number of field personnel by trade designation, number of technical and supervisory personnel working on the job, major equipment being used, description and status of all work in

progress as well as all new work started, location of work that the Contractor is performing, level of personal protection being used on-site, site safety meeting attendance list, volumes and categories of wastes handled, vehicle log, and the signature of the person making the entry. The names of visitors to the work locations and the purpose of their visit shall be recorded in the field notebook. The notebook shall be maintained in chronological order and all pages shall be dated and sequentially numbered. The notebook(s) shall become the property of the Government and shall be submitted to the MMR CO or designee (COR) at the conclusion of the contract.

### 3.03 MONTHLY REPORTS

Monthly reports shall include conditions at the remediation site such as daily feed and discharge air concentrations, system operating time and conditions, estimated quantity of contamination removed, problems causing temporary system shutdown, and other applicable information. Monthly reports will be submitted to the IRP office for review and approval. The IRP office will transmit the final monthly reports to the MADEP and the EPA.

### 3.04 PHOTOGRAPH AND VIDEOTAPE RECORDS

Photographs or videotapes of the site conditions shall be taken by the Contractor before work at an area commences and during all major phases of the work. Each picture or tape cassette shall be labeled with the project number, date, time, location, and identity of the recorder.

### 3.05 MANUFACTURER'S CERTIFICATES

- A. Prior to accepting installation, Contractor shall submit manufacturer's certificates for each item specified.
- B. Such manufacturer's certificates shall state that
  - 1. Equipment has been installed under either continuous or periodic supervision of manufacturer's authorized representative.
  - 2. It has been adjusted and initially operated in presence of manufacturer's authorized representative.
  - 3. It is operating in accordance with specified requirements, to manufacturer's satisfaction.
- C. All costs for meeting the above stated requirement shall be included in Contractor's bid price.

### 3.06 TRANSPORTATION, TREATMENT AND/OR DISPOSAL MANIFESTS

All fully signed manifests shall be submitted to the MMR CO or designee (COR) in a timely manner after receipt by the Contractor.

**\*\*\* END OF SECTION 01300 - SUBMITTALS \*\*\***

**SECTION 01510  
TEMPORARY FACILITIES**

**PART 1 - GENERAL**

**1.01 DESCRIPTION**

**Work Includes**

1. Provide such temporary facilities as the work may warrant.
2. Facilities include, but are not limited to:
  - a. Contractor's office and storage facilities.
  - b. Sanitary facilities conforming to local codes and OSHA requirements.
  - c. Trash containers.
  - d. Personal safety equipment
  - e. Signs, barricades, warning lights.
  - f. Fencing, if needed.
3. Upon completion of the work, completely remove all Contractor installed temporary facilities. Repair all damage caused by the installation or remediation.
4. Make all necessary arrangements for electricity, water, sanitary waste, and other utilities.

**PART 2 - PRODUCTS**

**2.01 OFFICE AND MATERIAL STORAGE FACILITIES**

- A. Provide and maintain
- B. Erect at a location approved by the MMR CO or designee (COR).
- C. Do not disturb, move, or interrupt without the MMR CO or designee (COR) approval.
- D. Provide lights, heat, and ventilation to permit comfortable use of office facilities.

**2.02 SANITARY FACILITIES**

**Sanitary Conveniences**

1. Provide chemical type toilets at Work Area and maintain in sufficient numbers, for the use of all persons employed on the job, and properly screen from the public observation, at suitable locations, in accordance with State and Local ordinances.
  - a. Empty periodically as required and dispose of in a timely manner satisfactory to the MMR CO or designee (COR).
  - b. When no longer required, remove from the site and dispose of the contents in a manner satisfactory to the MMR CO or designee (COR).



## 2.03 TEMPORARY LIGHT AND POWER

- A. Furnish, install and remove upon completion, all temporary light and power including temporary wiring, panel boards, connections to primary power lines, transformers, outlets, and wiring necessary to meet the requirements of trades/work involved. All such temporary electrical work shall meet the requirements of the National Electrical Code, the local utility company, and OSHA.
- B. Make all necessary arrangements with the local utility company or with MMR for temporary electric service. The Contractor shall be responsible for securing and paying for all electrical utility costs.
- C. Secure and pay for all required permits, certificates, notarizations, back charges for work performed by other, and other expenses incidental to the installation of the temporary electric service.

## 2.04 TRASH REMOVAL

- A. Provide dumpsters for general site trash collection with minimum weekly disposal. The size of the dumpster shall be at least six (6) cubic yards. Dumpster shall not be used for disposal of hazardous or special waste materials.
- B. Provide appropriate separate containers approved by the MMR CO or designee (COR) for storage and disposal of trash such as contaminated personal protective equipment. Clearly label containers with a description of contents.

## 2.05 PERSONNEL SAFETY EQUIPMENT

Furnish in compliance with State and Federal requirements.

## 2.06 SIGNS, BARRICADES, WARNING LIGHTS

All necessary equipment for the protection of the traveling public shall be furnished and maintained as specified in the Manual on Uniform Traffic Control Devices (Part VI). The Contractor is responsible for allowing/maintaining traffic flow across Greenway Road and access into "L" Range.

# PART 3 - EXECUTION

## 3.01 PERFORMANCE

- A. Field Offices and Storage Trailers: Site in approved locations and properly set up for all anticipated weather conditions.
- B. Obey and enforce other local sanitary regulations and orders, taking such precautions against infectious diseases as may be deemed necessary.

- C. All structures installed under this Section shall be provided with non-toxic, dry chemical, fire extinguishers meeting Underwriters Laboratories, Inc. approval for Class A, Class B, and Class C fires with a minimum rating of 2A, 10B, 10C. Locate and distribute fire extinguishers in accordance with NFPA 10, Portable Fire Extinguishers.

**\*\*\* END OF SECTION 01510 - TEMPORARY FACILITIES \*\*\***

**SECTION 01511**  
**BULLETIN BOARD AND PROJECT SIGNS**

**PART 1 - GENERAL**

**1.01 DESCRIPTION**

- A. Furnish and erect a project bulletin board, a project sign, and a project safety sign.
- B. Erect bulletin board and signs immediately upon beginning work under this contract.
- C. Locations of bulletin board and signs shall be as determined by the MMR CO or designee (COR).
- D. Upon completion of work under this contract, the bulletin board and signs shall be removed by and remain the property of the Contractor.
- E. Signs shall be painted by a professional sign painter.

**PART 2 - PRODUCTS**

Not applicable to this section

**PART 3 - EXECUTION**

**3.01 BULLETIN BOARD**

- A. Provide and install a weatherproof glass-covered bulletin board not less than 36 x 48 inches in size, for displaying the Equal Employment Opportunity Poster, a copy of the wage decision contained in the contract, Wage Rate Information Poster, and other information approved by the MMR CO or designee (COR).
- B. Locate at the site of work in a conspicuous place easily accessible to all employees as approved by the MMR CO or designee (COR).
- C. Legible copies of the aforementioned data shall be displayed until work under the contract is complete.

**3.02 PROJECT SIGN FOR NATIONAL GUARD BUREAU PROJECTS**

- A. Furnish and erect a project sign in conspicuous place and as approved by the MMR CO or designee (COR).
- B. Sign shall be not less than 48 x 96 inches in size and shall display the following information: National Guard Bureau, Installation Restoration Program, Title of Project, Contractor's name, and the name of the design engineer company.
- C. Colors and graphics for the sign shall be as approved by the MMR CO or designee (COR).

### 3.03 PROJECT SAFETY SIGN

Furnish and erect a project safety sign at the Contractor's field office. The safety sign shall be a minimum of 36 x 60 inches in size and located in a conspicuous place easily within view of all employees and visitors as approved by the MMR CO or designee (COR). Coordinate with the MMR CO or designee (COR) for sign details.

**\*\*\* END OF SECTION 01511 - BULLETIN BOARD AND PROJECT SIGNS \*\*\***

**SECTION 01562  
DUST CONTROL**

**PART 1 - GENERAL**

**1.01 DESCRIPTION**

Furnish and apply water on the roadway or haul roads for dust control.

**PART 2 - PRODUCTS**

**2.01 MATERIALS**

Water: Shall not be salt or brackish and free from oil, acid, and injurious alkali or vegetable matter.

**PART 3 - EXECUTION**

**3.01 SPRINKLING**

- A. Apply by methods approved by the MMR CO or designee (COR) and with equipment including a tank with gauge equipped pressure pump and a nozzle-equipped spray bar.
- B. Disperse through the nozzle under a minimum pressure of 20 pounds per square inch, gauge pressure.

**\*\*\* END OF SECTION 01562 - DUST CONTROL \*\*\***

## **SECTION 01600 MATERIAL CONTROL**

### **PART 1 - GENERAL**

#### **1.01 DESCRIPTION**

- A. This section covers packing and shipping, receiving, unloading, examining, and storage of materials and equipment to be installed in the project:
- B. Package, ship, receive, inspect, handle, and store materials and equipment in a manner that will protect such items from damage or deterioration.

#### **1.02 PACKING AND SHIPPING**

- A. Suppliers' preparation of equipment shall be suitable for long term storage in the climate at the site and be such that preventative maintenance is not required during storage.
- B. Identify all desiccants and inhibitors used and the required replacement frequency.
- C. Any internal bracing required only for shipping purposes shall be marked to indicate the proper sequence of its removal prior to operation.
- D. The outermost covering shall be clearly marked with the complete supplier identification, including weight.
- E. Boxes and crates shall be equipped with skids.
- F. Indicate the weight, lifting points, and/or center of gravity on the crate, skid, or package and utilize those indications for all handling procedures.
- G. Obtain from the supplier:
  - One set of any special wrenches, tools, fixtures, slings, lifting devices, and appurtenances necessary or convenient for erection, installation, or maintenance of the equipment.

#### **1.03 RECEIPT AND UNLOADING**

- A. Handle material and equipment in accordance with these specifications and any manufacturer's handling precautions that may be applicable to specific materials and equipment.
- B. Supply and use all specialized equipment, such as nylon slings or special hoisting equipment, where appropriate or required.

#### **1.04 ACCEPTANCE AT SITE**

##### **General**

- 1. The Contractor shall examine all materials and equipment upon arrival.

- 3.03 All equipment shall be compatible with the environment within which it shall be used. All equipment on which waste is adhering shall be decontaminated at the equipment decontamination area [established by Contractor and MMR CO or designee (COR)] by appropriate methods.
- 3.04 The Contractor shall prepare manifest forms and/or shipping papers for all wastes leaving the site in accordance with applicable federal, state, and local regulations. The Contractor shall be responsible for tracking the manifests and shipping papers, and shall provide fully signed copies to the MMR CO or designee (COR) within reasonable time after receipt. Manifesting of solid and liquid wastes shall be coordinated, in conjunction with the IRP office, through  
102<sup>ND</sup> FW EMO  
Contact: Chris Faux  
(508) 968-4233
- 3.05 The Contractor shall
- A. Transport waste from the project site directly to the final disposal site or to the waste treatment facility.
  - B. Be responsible for appropriate measurement of unit quantity of waste material removed from the site.
  - C. Coordinate vehicle inspection and recording of quantities leaving the site with the MMR CO or designee (COR). These quantities shall be compared to recorded quantities received at the disposal/treatment facilities. The Contractor shall immediately resolve any discrepancies that occur and determine the probable cause for the discrepancy.
  - D. Be solely responsible for any and all action necessary to remedy situations involving waste spilled in transit.

**\*\*\* END OF SECTION 01610 - TRANSPORTATION AND  
HANDLING OF WASTE MATERIALS \*\*\***

## **SECTION 01710 SITE MAINTENANCE**

### **PART 1 - GENERAL**

#### **1.01 DESCRIPTION**

- A. Maintain premises and public properties free from accumulations of waste, debris, and rubbish, caused by operations.
- B. At completion of work, remove waste materials, rubbish, tools, equipment, machinery, and surplus materials, and clean all sight-exposed surfaces; leave project clean and ready for occupancy.

#### **1.02 SAFETY REQUIREMENTS**

- A. Standards: Maintain project in accordance with the following safety and insurance standards: Manual of Accident Prevention in Construction - Association of General Contractors (AGC)
- B. Hazards Control
  - 1. Store volatile wastes in covered metal containers, and remove from premises daily.
  - 2. Prevent accumulation of wastes which create hazardous conditions.
  - 3. Provide adequate ventilation during use of volatile or noxious substances.
- C. Conduct cleaning and disposal operations to comply with local ordinances and anti-pollution laws.
  - 1. Do not burn or bury rubbish and waste materials on project site unless permits are obtained from agencies having jurisdiction.
  - 2. Do not dispose of volatile wastes such as mineral spirits, oil, or paint thinner in storm or sanitary drains or onto the ground.
  - 3. Do not dispose of wastes into streams or waterways.

### **PART 2 - PRODUCTS**

#### **2.01 MATERIALS**

- A. Use only cleaning materials recommended by manufacturer of surface to be cleaned.
- B. Use cleaning materials only on surfaces recommended by cleaning material manufacturer.



## PART 3 - EXECUTION

### 3.01 DURING CONSTRUCTION

- A. Execute cleaning to ensure that buildings, grounds, and public properties are maintained free from accumulations of waste materials and rubbish.
- B. Wet down dry materials and rubbish to lay dust and prevent blowing dust.
- C. At reasonable intervals during progress of work, clean site and public properties, and dispose of waste materials, debris, and rubbish.
- D. Provide on-site containers for collection of waste materials, debris, and rubbish.
- E. Remove waste materials, debris, and rubbish from site and legally dispose of at public or private dumping areas off MMR or State property.
- F. Handle materials in a controlled manner with as few handlings as possible; do not drop or throw materials from heights.
- G. Schedule cleaning operations so that dust and other contaminants resulting from cleaning process will not fall on wet, newly painted surfaces.
- H. If MMR CO or designee (COR) determines that site maintenance is not sufficient, the Contractor shall immediately take corrective action as specified by the MMR CO or designee (COR).

### 3.02 FINAL CLEANING

- A. In preparation for substantial completion or occupancy, conduct final inspection of sight-exposed interior and exterior surfaces, and of concealed spaces.
- B. Remove grease, dust, dirt, stains, labels, fingerprints, and other foreign materials from sight-exposed interior and exterior finished surfaces; polish surfaces so designated to shine finish.
- C. Repair, patch, and touch-up marred surfaces to specified finish, to match adjacent surfaces.
- D. Broom clean paved surfaces; rake clean other surfaces of ground.
- E. Maintain cleaning until project is turned over to MMR.

**\*\*\* END OF SECTION 01710 - SITE MAINTENANCE \*\*\***

**DIVISION 2**  
**SITE WORK**

**SECTION 02015  
SUBSURFACE INFORMATION**

**PART 1 - GENERAL**

**1.01 DESCRIPTION**

- A. Various subsurface explorations have been taken at MMR for the sole purpose of assisting the Engineer in the design of the project facilities.
- B. Explorations are not intended to indicate subsurface conditions except at the locations of the borings and are based on the information available and the Engineer's interpretations at the time borings were made.
- C. Explorations were not made for, nor intended to be used by the Contractor for purposes of determining or facilitating the constructability of the project or the cost thereof. Therefore, they may not be suitable or adequate for any purpose other than for the Engineer's use in designing the project.
- D. Any interpretation of the exploration logs or other subsurface information prepared by the Engineer on behalf of MMR, by the Contractor or its subcontractors, regardless of tiers, shall be at its own risk and without legal liability on the Engineer or MMR. Therefore, the Contractor shall indemnify and hold the Engineer and MMR harmless from all claims, damages, expenses or costs resulting from the Contractor's interpretation of this information.
- E. Additional test borings and other exploratory operations may be made by Contractor at no additional cost to the Government unless specifically approved by the MMR CO or designee (COR).

**PART 2 - PRODUCTS**

Not applicable to this section.

**PART 3 - EXECUTION**

Not applicable to this section.

**\*\*\* END OF SECTION 02015 - SUBSURFACE INFORMATION \*\*\***

**SECTION 02016  
EXISTING UTILITIES AND UNDERGROUND STRUCTURES**

**PART 1 - GENERAL**

**1.01 DESCRIPTION**

- A. The existing utilities shown on the Drawings are shown diagrammatically and it is not to be inferred that the locations shown are precise.
- B. Coordinate with and receive approval to commence from applicable utility owners and MMR prior to excavation in areas where it is reasonable to expect the presence of existing utilities, where shown on the Drawings or not. Utilities required for system operation shall be coordinated through the local utility companies. The Contractor shall obtain digging permits from both the Base Civil Engineer (Bldg. 971), and the DIG SAFE Corporation prior to conducting any excavation. All utility costs shall be the responsibility of the Contractor.
- C. Contractor shall be responsible for any and all damage to any existing utilities, caused by his efforts.
- D. Contractor shall contact the affected utility owner and the MMR CO or designee (COR) as soon as any damage is uncovered.
- E. In areas where existing underground structures are shown or suspected, carefully uncover such structures to such extent as to enable the MMR CO or designee (COR) to determine what adjustments if any need to be made to accommodate the presence or removal of such structures.
- F. Contractor shall make all efforts necessary to immediately repair any and all damage caused by his/her efforts prior to continuing regular contract work. The MMR CO or designee (COR) shall concur with all repair work prior to the Contractor continuing regular contract work.

**PART 2 - PRODUCTS**

Not applicable to this section.

**PART 3 - EXECUTION**

Not applicable to this section.

**\*\*\* END OF SECTION 02016 -  
EXISTING UTILITIES AND UNDERGROUND STRUCTURES\*\*\***

## **SECTION 02102 CLEARING AND GRUBBING**

### **PART 1 - GENERAL**

#### **1.01 DESCRIPTION**

##### **A. Work includes**

1. Clearing and grubbing work, when applicable, includes but is not limited to, removal of trees, brush, stumps, wooded growth, grass, shrubs, poles, posts, signs, fences, culverts and other vegetation and minor structures.
2. Protection of designated wooded growth.
3. Storage and protection of minor structures and materials which are to be replaced.
4. Disposal of nonsalvageable structures and materials, and necessary preliminary grading.

##### **B. Limits of work**

1. Perform clearing work within the areas required for construction or as shown on the Drawings.
2. Perform additional clearing work within areas and to depths which may be designated by the MMR CO or designee (COR).

### **PART 2 - PRODUCTS**

Not applicable to this section.

### **PART 3 - EXECUTION**

#### **3.01 PREPARATION**

Protect existing trees and other vegetation indicated or directed by the MMR CO or designee (COR) to remain in place, against unnecessary cutting, breaking or skinning of roots, skinning and bruising of bark, smothering of trees by stockpiling construction materials or excavated materials within drip line, excess foot or vehicular traffic, or parking of vehicles within drip line.

#### **3.02 PERFORMANCE**

##### **A. Clearing**

1. Remove trees, shrubs, grass, weeds and other vegetation, improvements, or obstructions that interfere with installation of new construction.

2. Removal includes new and old stumps of trees and their roots.
  3. Carefully and cleanly cut roots and branches of trees indicated to be left standing, where such roots and branches obstruct new construction.
  4. Tree wound paint: Apply to all cut surfaces of trees to remain and to all surgically repaired areas damaged by construction.
- B. Salvage of Timber: (Unless otherwise directed by MMR)
1. Cut all trees over four inches in diameter into four foot lengths and remove from the Base or chip on site at the Contractor's option.
  2. Chip all brush, branches and small trees less than four inches in diameter.
  3. Where chips are not to be salvaged, distribute in a thin layer over the ground in wooded areas or remove and dispose of them offsite.
- C. Disposal
1. Burning of materials shall not be permitted.
  2. Removal
    - a. Remove material from the site daily as it accumulates and legally dispose of.
    - b. Should the Contractor be allowed to continue work beyond normal working hours, do not allow material to accumulate for more than 48 hours.
  3. Dumping: Dispose of material in an approved off site legally operated disposal area.
  4. Chipping: Reduce to dimensions of less than two inches by the use of an approved chipping machine.

**\*\*\* END OF SECTION 02102 - CLEARING AND GRUBBING \*\*\***

**SECTION 02140  
DEWATERING**

**PART 1 - GENERAL**

**1.01 DESCRIPTION**

The requirements for dewatering are specified in this section. Any other dewatering specifications listed throughout this document shall also apply.

**PART 2 - PRODUCTS**

Not applicable to this section.

**PART 3 - EXECUTION**

**3.01 DEWATERING**

The Contractor shall be responsible for selecting, furnishing, installing, maintaining, operating, and removing the dewatering system as necessary in performance of the work specified herein and as related to other sections of the specifications.

The Contractor shall dewater the excavated areas should precipitation, surface runoff, or any other liquid accumulate (1) during removal of soils (2) during installation of below-grade piping, or (3) before and during backfilling.

**\*\*\* END OF SECTION 02140 - DEWATERING \*\*\***

## SECTION 02160 EXCAVATION SUPPORT SYSTEMS

### PART 1 - GENERAL

#### 1.01 DESCRIPTION

The Contractor shall provide protective support measures consisting of shores, walls, braces, posts, piling, sheeting, anchorages, or fastenings, both temporary and permanent, for accomplishment and protection of work. When excavation support is required to accomplish the work, all work shall be completed per 29 CFR 1926.650, Subpart P, "Excavations, Trenching, and Shoring." Any braced excavations required shall be designed by a geotechnical engineer registered in the Commonwealth of Massachusetts. Should the need be determined during the progress of the work, all work affected by the unstable excavation shall be stopped and the MMR CO or designee (COR) shall be notified. The MMR CO or designee (COR) shall then review and approve the proposed plan for excavation support.

### PART 2 - PRODUCTS

#### 2.01 MATERIALS

The Contractor shall furnish structural grade planks, beams, and posts as defined and specified for stress-grade lumber in the American Lumber Standards. Lumber may be rough, untreated, in random lengths, and shall be of standard dimensions.

The Contractor shall furnish lumber for shores, wales, and sheeting of grading required by the American Lumber Standards for the particular application.

### PART 3 - EXECUTION

#### 3.01 INSTALLATION

Sheeting and bracing for trench and structure excavation should be installed progressively as the removal of excavated materials requires. To prevent the erosion of voids outside the sheeting, planks should be butted to exclude groundwater. In soft, wet ground, sheeting should be driven to a lower level as excavation progresses so that the sheeting is embedded in undisturbed earth. Walls and struts should be installed at close intervals to prevent displacement of the surrounding earth to maintain safe conditions in the work area. Any damage proven to result from improper installations shall be the responsibility of the Contractor.



### 3.02 REMOVAL

Temporary sheeting for trench and structure excavation may be removed and reused where soils and groundwater are uncontaminated. Where contaminated soils and groundwater exist, the sheeting and other support materials shall be considered as contaminated and shall be properly loaded, transported, and disposed of by the Contractor.

Individual planks shall be withdrawn alternately as the backfill is raised, maintaining sufficient sheeting and bracing to protect the work and workmen. Bracing shall be removed completely.

Where unstable conditions occur in the underlying strata from any cause, and removal of sheeting shall endanger the work, a portion of the sheeting, including bracing, may be left in place with approval of the MMR CO or designee (COR). Remove all wood within a zone extending four feet below finished grade. Leaving such material in place shall not be cause for an increase in contract price.

**\*\*\* END OF SECTION 02160 - EXCAVATION SUPPORT SYSTEMS \*\*\***

## **SECTION 02200 EARTHWORK**

### **PART 1 - GENERAL**

#### **1.01 DESCRIPTION**

The Contractor shall provide all labor, equipment, tools, material, and services needed to accomplish all site preparation, excavation, backfill and compaction, and all incidental appurtenant work.

#### **1.02 WORK INCLUDED IN THIS SECTION**

The principal items are:

- A. site preparation,
- B. soil excavation,
- C. compaction of backfill,
- D. drainage control, and
- E. site cleanup.

#### **1.03 SITE INSPECTION**

The Contractor shall carefully examine the site and make all inspections necessary to determine the full extent of the work required. The Contractor shall satisfy himself of the nature and location of the work, conditions, the conformation and condition of the existing ground surface, and the character of equipment and facilities needed prior to and during progression of the work. The Contractor shall satisfy himself of the character, quality, and quantity of surface and subsurface materials or obstacles to be encountered. Any inaccuracies or discrepancies between the actual field conditions and the Drawings, or between the Drawings and specifications, shall be brought to the attention of the MMR CO or designee (COR) to clarify the exact nature of the work to be performed.

#### **1.04 QUALITY ASSURANCE**

- A. The Contractor shall exercise due care to ensure that procurement, storage, and placement of materials to be used at the site shall comply with the requirements, specifications, and standards set out herein. The Contractor may have, at his discretion, such tests and inspections as he may desire performed by qualified personnel or independent testing services.

The MMR CO or designee (COR) shall be the on-site arbiter and judge of the acceptability of the work done, based on such observations and tests he may require or perform.

B. Applicable Criteria, Tests, and Standards

1. Site Earthwork: Rough graded surface ready to receive topsoil, sod, or seed, crushed rock, or aggregate base shall be graded to the designed grade. All areas shall be finished so as to drain readily with a minimum of a two percent slope.
2. Soils Testing: Contractor shall provide testing of prepared subgrade and compacted fill. Testing shall include tests covered under Article of Compaction. The Contractor shall submit the results of the soil testing to the MMR CO or designee (COR) within 10 working days after all piping trenches have been backfilled.
3. Unsuitable Material: Material deemed unsuitable from tests or visual inspection and all material delivered for fill or embankment, which cannot be satisfactorily compacted, shall be hauled off-site and disposed of in accordance with applicable federal, state, and local laws.
4. Cleanup: The Contractor shall remove all rubbish, debris, temporary materials, and any waste excavated materials from the project site and dispose of the material in accordance with the specifications herein and with all applicable laws, regulations, and permits. The Contractor shall restore the staging and storage areas and temporary roads to the satisfaction of the MMR CO or designee (COR).

C. Compaction

A minimum compaction of 85 percent of the maximum density at  $\pm 2$  percent of the optimum moisture content shall be maintained in any grassed areas. All backfill beneath roads, pavement, or near structures shall have a compaction of 95 percent of the maximum density at  $\pm 2$  percent of the optimum moisture content. It is the responsibility of Contractor to determine the optimum density and moisture content of the soils at the excavation sites. The Contractor shall perform the most recent version of Standard Proctor (using either ASTM D2922, D1556, D2216, or D3017) to measure compaction density.

PART 2 - PRODUCTS

2.01 GENERAL

The Contractor shall provide all labor, materials, and equipment necessary to accomplish the work specified herein.

## 2.02 EARTH BACKFILL

All earth backfill shall be obtained from the excavated soil associated with the pipe trenching or from an off-site borrow area. The earth backfill shall be free from roots, trash, debris, rocks larger than 3 in.; and other deleterious materials and shall be acceptable to the MMR CO or designee (COR).

## 2.03 WATER FOR COMPACTION

Under no circumstances shall the excavation be flooded with water for compaction.

## 2.04 COMPACTION EQUIPMENT

The compaction equipment shall be of suitable type and energy output to obtain the densities specified herein, and shall provide satisfactory compaction of materials to form a dense fill.

Compaction equipment shall be operated in accordance with the manufacturer's instructions and recommendations. Equipment shall be maintained in such condition that it shall deliver the manufacturer's rated compactive effort. If inadequate densities are obtained, additional equipment shall be provided by the Contractor. Any hand-operated equipment used shall be capable of achieving the specified densities.

## 2.05 MOISTURE CONTROL EQUIPMENT

Equipment for applying water shall be of a type and quality adequate for the work, shall not leak, and shall be equipped with approved sprinkler or nozzle devices to assure uniform application of water. Equipment for mixing and drying out material shall consist of blades, discs, or other approved equipment. Water shall be obtained from a source that is not contaminated by hydrocarbons or other toxic substances.

# PART 3 - EXECUTION

## 3.01 GENERAL

It shall be the Contractor's responsibility to (1) maintain adequate safety measures and working conditions as discussed herein and (2) take all measures necessary during the performance of the work to protect the entire project area and adjacent properties which would be affected by this work from storm damage, flood hazard, caving of trenches and embankments, and sloughing of material, until final acceptance by the MMR CO or designee (COR). It shall be the Contractor's responsibility to maintain the safety and to protect the completed areas until the entire project is in satisfactory compliance with the job specifications.

### 3.02 DRAINAGE CONTROL

- A. The Contractor shall manage the drainage water from the construction operations area and storm water reaching the construction area from any source so that no damage is done to the excavation, pipe, or structures. The Contractor shall be responsible for any damage to persons or property on or off the construction site due to such drainage water, or to the interruption or diversion of storm water on account of the Contractor's operations.
- B. Such grading shall be done to prevent surface water from flowing into excavations, and any water accumulating therein shall be removed by pumping or by other approved methods and disposed of as surface water discharge downgradient of the excavation site.

### 3.03 EXCAVATION

The Contractor shall safely complete all excavation regardless of the materials encountered. The Contractor shall make his own estimate of the kind and extent of the various materials that shall be encountered in the excavations, as well as the presence or absence of water.

Excavated soil determined as suitable soil by the MMR CO or designee (COR) may be used as backfill. Soil and other material excavated and classified as uncontaminated but unsuitable for backfill material shall be the responsibility of the Contractor. The Contractor shall load, transport, and dispose of such material off-site according to all applicable federal, state, and local regulations and codes and approval of the MMR CO or designee (COR). The Contractor shall also restore the excavation site, structures, and working utilities to their pre-excavation condition or better as specified herein.

Soil shall be periodically monitored during excavation activities for evidence of contamination with a photoionization detector (PID). If readings are higher than five ppm, contaminated soil shall be segregated and properly containerized, transported, treated, and/or disposed of by the Contractor. Contaminated soil is not anticipated during excavation activities.

Health and safety measures shall be maintained during trenching and shoring, and disposal of excavated materials as discussed in this document.

### 3.04 PLACING, SPREADING, AND COMPACTING FILL MATERIALS

The backfill shall be placed by the Contractor in thin layers that, when compacted, shall not exceed eight inches. Each layer shall be spread evenly and shall be thoroughly mixed during the spreading to obtain uniformity of material in each layer.

When the moisture content of the fill material is two percent or more below that required for optimum moisture content, water shall be added by the Contractor until the moisture content is as specified. When the moisture content of the fill material is two percent or more above that required for optimum moisture content, the fill material shall be aerated and dried by the Contractor by blading, mixing, or other satisfactory methods until the moisture content is as specified.

After each layer has been placed, mixed, and spread evenly, it shall be thoroughly compacted by the Contractor to the specified density. Equipment shall be of such design that it shall be able to compact the fill to the specified density. Compaction shall be continuous over the entire area and the equipment shall make sufficient passes over the material to ensure that the desired density has been obtained.

**\*\*\* END OF SECTION 02200 - EARTHWORK \*\*\***

## **SECTION 02223 SITE RESTORATION**

### **PART 1 - GENERAL**

#### **1.01 DESCRIPTION**

Restoration requirements are specified in this section. Restoration is defined as the correction, by repair or replacement, of utilities, grassed areas, pavement, roads, sidewalks, curbing, and any on-site structures damaged or altered as a result of the Contractor's operations.

#### **1.02 RECORDS**

The Contractor, as directed by the MMR CO or designee (COR), is responsible for recording the preconstruction site conditions by photograph or videotape. These records shall be used by the Contractor and the MMR CO or designee (COR) to ensure that the site has been restored to its preconstruction condition or better.

### **PART 2 - PRODUCTS**

- A. Topsoil, reasonably free from subsoil, clay lumps, stones, brush, stumps, roots, litter, and other substances which may be harmful to vegetation or supporting maintenance operations.
- B. Asphalt pavement as specified in Section 02510.
- C. Seeding as specified in Section 02931.

### **PART 3 - EXECUTION**

#### **3.01 PAVING AND SEEDING**

Specifications for paving and seeding are provided in Section 02510 and 02931, respectively.

If restoration is required for items not specified in this section, restoration shall be to the condition existing prior to the start of the contract work or better and shall be made to the satisfaction of the MMR CO or designee (COR).

**\*\*\* END OF SECTION 02223 - SITE RESTORATION \*\*\***

## SECTION 02510 ASPHALT PAVING

### PART 1 - GENERAL

#### 1.01 DESCRIPTION

This section specifies the requirements for resurfacing areas disturbed during site excavation work.

### PART 2 - PRODUCTS

#### 2.01 MATERIALS

- A. Processed Gravel Base: Shall meet the relevant requirements of Section 405, "Gravel Base Course," and Section M1.02.1, "Processed Gravel for Subbase of the Commonwealth of Massachusetts," Department of Public Works, "Standard Specifications for Highways and Bridges," Latest Edition.
- B. Bituminous Concrete Pavement, Type I-1: Shall meet the relevant requirements of Section 460 of the Commonwealth of Massachusetts, Department of Public Works, Standard Specifications for Highways and Bridges, Latest Edition.
- C. Tack Coat: Emulsified asphalt: SS-1, SS-1h.

### PART 3 - EXECUTION

#### 3.01 SPECIFICATIONS

- A. The Contractor shall repave the excavated areas, any other areas where the activities have damaged the asphalt or concrete surfaces, and the areas designed on the Drawings.
- B. Asphalt paving shall be done in dry weather when subgrade is sufficiently stable and dry to prevent trapping excessive moisture under pavement.
- C. Base course shall be placed in compacted layers not more than six inches thick. Compact base material is not less than 95 percent of maximum density per ASTM D1557, Method D.
- D. Tack Coat shall be applied uniformly with a pressure distributor at a temperature of 125-150°F prior to surface course application. Surface shall be clean and dry before Tack Coat application. Application rate shall be 0.5 gallons per square yard. Tack Coat shall be applied only so far in advance as is necessary to obtain proper condition of tackiness.



- E. Surface Course shall be spread evenly and continuously over base course using a paving machine. Construct surface course only when atmospheric temperature is above 40°F, when the underlying base is dry, and when weather is not rainy. Rolling equipment shall be used to assure all roller marks are eliminated and no further compression is being achieved. Finished thickness shall be two inches. Finished surface shall be smooth and true to grade with all surfaces draining. No traffic shall be permitted on pavement for 24 hours. Places not accessible to roller shall be thoroughly compacted with mechanical or hand tampers to equivalent compaction and appearance.
- F. All adjacent property shall be protected from splatter or stain during paving operations. The Contractor shall satisfactorily clean or replace soiled items to the approval of the MMR CO or designee (COR) at no additional cost.
- G. The asphalt shall be tested after placement to ensure that proper thickness and compaction have been achieved.
- H. At completion of paving, all excess asphaltic materials, scraps, rubbish, etc., due to this work shall be satisfactorily disposed of off-site leaving the site in a neat, clean, and orderly condition.

**\*\*\* END OF SECTION 02510 - ASPHALT PAVING \*\*\***

**SECTION 02672**  
**AIR SPARGING AND SOIL VENTING WELLS**

**PART 1 - GENERAL**

**1.01 DESCRIPTION**

This section specifies requirements for the 22 air sparging and 21 soil venting wells to be drilled. The Contractor shall be aware that a clay/silt layer has been observed approximately 70 feet below the water table in the FS-12 source area. If the layer is encountered during drilling for air sparging wells, drilling shall cease and well(s) shall be completed to just above the clay/silt layer.

**1.02 DESCRIPTION OF WORK**

- A. The Contractor will provide all necessary personnel, equipment, and materials required to install all 43 wells and appurtenances. The Contractor shall obtain approval for the well locations from the MMR CO or designee (COR) prior to drilling.
- B. Work to be completed shall include:
  - 1. Drill all wells to depths and at locations shown on the Drawings. No soil samples will be collected from these borings.
  - 2. Install all piping and screening; seal annular space around piping as shown on the Drawings.
  - 3. Develop all wells in accordance with procedures specified in Section 3.02.
  - 4. Completion of boring logs, well completion diagrams, and development logs.

**1.03 SUBMITTALS**

Well Completion Diagrams, Boring Logs, and Development Logs

**PART 2 - PRODUCTS**

**2.01 EQUIPMENT, MATERIALS, TOOLS, CONTAINERS, ETC.**

- A. Drill rigs and tools: Drill rigs shall be specifically designed and manufactured for production well drilling. Drill rigs and tools that are not adequate, in the opinion of the MMR CO or designee (COR), will not be permitted.
- B. Well materials: Riser shall be joined to distribution piping as shown on the Drawings.
- C. Backfill materials: Shall consist of in situ soils (sand and gravel), bentonite slurry seal and grout placed as specified by the Drawings.

D. Sand

1. Composition: Minimum 99 percent rounded siliceous particles with a maximum of 1 percent calcareous particles.
2. Size: At least 90 percent by weight of the sand is coarser than the screen slot size.

E. Pea gravel: Gravel shall be clean stone suitable for use as drain fill material. The gravel will be graded from 3/8-inch to No. 8 sieve size.

F. Manholes: Manholes shall be precast reinforced concrete sections with flat tops and covers as specified on the Drawings. Contractor has the option to propose concrete manholes poured in place or substitute plastic/fiberglass material for reinforced concrete material.

## PART 3 - EXECUTION

### 3.01 DRILLING OPERATIONS

The Contractor will drill borings using a truck mounted drill rig capable of advancing 4 1/4-inch ID and 8 1/4-inch ID hollow-stem augers. The Contractor will utilize a stainless steel knock-out plug on the drill-bit during drilling to prevent entry of drill cuttings into the inside of the augers. The Contractor will knock-out the plate prior to well installation activity, using a down-hole hammer assembly, or equivalent. The Contractor may also propose an alternate drilling technique that will accomplish the work specified.

### 3.02 WELL DEVELOPMENT

Well development will proceed after a minimum of 48 hours have elapsed since completion of well installation. The Contractor will develop each well until: 1) a minimum volume of three well casing volumes plus the volume of potable water added to the well during drilling/installation activities has been purged; 2) sediment-free water is observed; and 3) the physical parameters of pH, temperature, specific conductance, and dissolved oxygen have stabilized to within 10 percent over three consecutive measurements. The Contractor shall develop all wells using the dual-line air lift method, the hydraulic jetting method, or equivalent method to adequately accomplish the work specified.

### 3.03 PERMITS AND REGULATIONS

Permits and licenses of a temporary nature necessary for the execution of the Contractor's work shall be secured and paid for by the Contractor. The Contractor shall give all notice and comply with all laws, ordinances, rules, and regulations bearing on the conduct of the work as described in the scope of work specified.

### 3.04 ABANDONMENT AND COMPLETION OF BORINGS

- A. Borings shall not be abandoned before reaching the final depth, except with the approval of the MMR CO or designee (COR). No payment will be made for borings abandoned because of an accident or negligence attributable to the Contractor.
- B. Borings abandoned before reaching required depth, because of an obstruction or other reasonable cause not permitting completion of the boring by standard procedures, shall be replaced by a supplementary boring adjacent to the original and carried to the required depth. Penetration to the completed depth of the original boring may be made by means other than specified above only with the MMR CO or designee's (COR) approval.
- C. Abandoned borings may be allowed to collapse and be backfilled with native sand. In the event contaminated soil is encountered, the borehole will be cement grouted from the water table to ground surface. No grouting will be permitted below the water table.
- D. The MMR CO or designee (COR) make no representations as to the exact character of the subsurface materials through which the borings are to be advanced, or that any boring location given will be found free from obstruction.

### 3.05 CLEAN UP

Upon completion of the work, the Contractor shall remove its rigs and all surplus and unused material and leave the site in a clean condition to the satisfaction of the MMR CO or designee (COR).

### 3.06 DRILLING FLUIDS, SOLVENTS, GLUES AND LUBRICANTS

During completion of the work, the Contractor shall not use any drilling fluids other than potable water or approved drilling mud. The Contractor shall not use oil, grease, or other petroleum derived lubricants on drill rods, tools, and casings. Any material employed as a drilling fluid or lubricant shall be approved by the MMR CO or designee (COR) prior to its use.

### 3.07 DECONTAMINATION

All drill rigs, pumps, and tools (casing and rods) shall be steam cleaned prior to setting up at the drilling location and prior to departure. More frequent decontamination of rigs may be required depending on actual exposure to contaminated conditions. Containerize decontamination water if cuttings generated during drilling are determined to be contaminated. Alternative decontamination procedures and methods shall be approved by the MMR CO or designee (COR) prior to their use. Perform decontamination at a specially designated decontamination area as authorized by the MMR CO or designee (COR).

### 3.08 INSPECTION OF WORK

The MMR CO or designee (COR) shall at all times have access to the work, and the Contractor shall provide proper facilities for such access and for inspection. Drilling and well installation shall be in accordance with the requirements of these specifications and authorization of the MMR CO or designee (COR) and will be inspected by a representative of the MMR CO or designee (COR) at its discretions.

### 3.09 DISPOSAL OF CUTTINGS AND WELL DEVELOPMENT WATER

Monitor cuttings generated during drilling with a PID for evidence of contamination. If readings are higher than five ppm, segregate cuttings and decontamination fluids in DOT approved containers (Spec 17H for soils and 17E for fluids), supplied by the Contractor. Transportation, disposal, and/or treatment of contaminated wastes and all costs associated with these activities will be the responsibility of the Contractor.

**\*\*\* END OF SECTION 02672 - AIR SPARGING AND SOIL VENTING WELLS \*\*\***

**SECTION 02831**  
**CHAIN LINK FENCES AND GATES**

**PART 1 - GENERAL**

**1.01 DESCRIPTION**

This section specifies the requirements for the fences and gates around the propane storage area and the boundary line fence as detailed on the Drawings.

**PART 2 - PRODUCTS**

**2.01 MATERIALS**

- A. Barbed wire: Shall be galvanized No. 7 gauge, 3 strands installed on a 45 degree return bracket tilted out towards the property boundary as shown on the Drawings.
- B. Chain Link Fabric: Shall be No. 9 gauge with 2 inch square openings, heavily galvanized with two ounces of coating per square foot. Twisted ends of the chain link material shall not be knuckled over. The end shall remain open and exposed on both the top and bottom of the fence.
- C. Fence and Gate Posts: Shall be heavily galvanized and constructed of Schedule 40 piping material. The corner and gate posts shall have a nominal diameter of four inches as shown on the plans. The line and intermediate posts shall have a nominal diameter of 2.5 inches as shown on the plans. Posts shall have all the fittings, hardware and other appurtenances specifically covered by the plans and specifications and shall be standard commercial grade and in accordance with current standards of practice and ASTM F-626.
- D. Brace Rails: Shall be heavily galvanized and installed at each corner post as shown on the plans.
- E. Truss Rods: Shall be 3/8 inch and be installed with turnbuckles. Truss rods shall be installed at each corner post and each intermediate post as shown on the Drawings.
- F. Spring Tension Wire: Shall be heavily galvanized No. 7 gauge and shall be placed not more than two inches from the top and bottom of the chain link fence fabric as shown on the Drawings. Tension wire shall be fastened to the posts with No. 6 gauge steel clips. A minimum of five turns around the spring tension wire shall be required to end the installation.
- G. Hog Rings: Shall be attached every 12 inches along the top and bottom of the fence and will secure the chain link fabric to the tension wire. Hog rings shall be galvanized No. 11 gauge.
- H. Swing Gates: The fabrication and installation of swing gates shall conform to ASTM F-900. Swing gate hardware shall be made of certified malleable hot dipped

galvanized. Hinges of ball and socket design with full 180° swing from closed to open position. Swing gate latches to permit gate to swing one way only. All gate latches shall be made with provision for padlock. The Contractor to provide the padlock.

## PART 3 - EXECUTION

### 3.01 SPECIFICATIONS

- A. General Instructions: The Contractor shall perform such clearing as specified on the Drawings and as necessary within the set clearing lines to construct the fence to the required grade and alignment. The Contractor shall use a Massachusetts-licensed land surveyor to properly locate the MMR boundary and fence lines as detailed on Drawing No. ASSV-18. The Contractor shall install temporary guys or braces as may be required to hold the posts in the proper position until such time as the concrete has set sufficiently to hold the posts in place. Unless otherwise permitted, no materials shall be installed on the posts until the concrete is set and approval is granted by the MMR CO or designee (COR). The tops of all posts shall be set to the required grade and alignment. Cutting of the tops of the posts will be allowed only with the approval of the MMR CO or designee (COR). The chain link fencing shall be firmly attached to the posts and braces in the manner indicated on the Drawings. The chain link fencing shall be attached to the sides of the post facing outward from the property of the Massachusetts Military Reservation. The chain link fencing fabric shall be stretched taut and be installed to the required elevations.
- B. Post spacing: All posts shall be spaced eight feet on center with intermediate posts erected every 200 feet.
- C. Height of Fence: The fence shall be six feet high from finish grade with one foot of barbed wire consisting of three strands for an overall height of seven feet as shown on the Drawings.
- D. Concrete Footings: All posts shall be set in concrete with a minimum footing depth of three feet six inches. This fence post shall be held up from the bottom of the footings a minimum of six inches as shown on the Drawings. Corner posts and gate posts footings shall have a minimum outside diameter of 18 inches. Line posts and intermediate posts shall have a minimum outside diameter of 12 inches. The exposed concrete at finish grade shall slope a minimum of 1/2 inch per foot away from the posts insuring proper drainage as shown on the Drawings.
- E. Ground Levels Under the Fence: The Contractor shall limit the opening gap between the final grade and the bottom of the chain link fabric beneath the fence to two inches.
- F. Fasteners: All bolts utilized in the construction of the property line fence shall be mashed with a hammer or with a chisel to render the bolts unremovable by unauthorized persons. The MMR CO or designee (COR) shall inspect and approve these fasteners after installation to ensure that unauthorized persons will be

sufficiently deterred in efforts to remove fasteners. This section does not apply to the propane storage fence fasteners.

- G. Grounding: At each location where an electrical transmission, distribution, or secondary line crosses the fencing, the contractor shall furnish and install grounding conforming to the requirements of Section 9 of the National Electric Safety Code.

**\*\*\* END OF SECTION 02831 - CHAIN LINK FENCES AND GATES \*\*\***



## SECTION 02931 SEEDING

### PART 1 - GENERAL

#### 1.01 DESCRIPTION

Furnish and place lime, fertilizer, and seed in the areas where normal ground cover has been destroyed by construction activity, and maintain new seeding as specified in this Section.

### PART 2 - PRODUCTS

2.01 MATERIALS: Obtain and retain as part of the project records, certifications, and/or labels of materials supplied.

- A. Fertilizer: Type 10-10-10 grade containing at least 10 percent available nitrogen, 10 percent readily available phosphoric acid and 10 percent total available potash in conformity with the Standards of the Association of Official Agricultural Chemists.
- B. Lime: Ground limestone composed of not less than 85 percent calcium and magnesium carbonate; at least 50 percent shall pass a No. 100 mesh screen, 95 percent shall pass a No. 8 mesh screen.
- C. Seed:
  - 1. The grass seed mixture shall include no "primary noxious weed seeds."
  - 2. Furnish in fully labeled, standard, sealed containers.
  - 3. Percentage and germination of each seed type in the mixture, purity, and weed seed content of the mixture shall be clearly stated on the label.
  - 4. Seed which has become wet, moldy, or otherwise damaged will not be acceptable.
  - 5. Use permanent seed at the following composition:

| <u>Seed Type</u>               | <u>Percent Live Seed Per Acre, Pounds</u> |
|--------------------------------|---|
| Redtop                         | 20  |
| Perennial Ryegrass (Manhattan) | 20  |
| Kentucky Bluegrass             | 15  |
| Red Fescue (Creeping)          | 30  |
| TOTAL                          | 85  |

## PART 3 - EXECUTION

### 3.01 PREPARATION

- A. All areas to be seeded
  - 1. Disk, harrow, drag with a chain or mat, blade, machine-rake, or hand-work as necessary to provide a reasonably firm but friable seedbed.
  - 2. Take care to prevent the formation of low places and pockets where water will stand.
  - 3. All stones larger than 1-1/2 inches shall be removed prior to seeding.
- B. Depth of tillage: four inches or as directed.

### 3.02 APPLICATION

#### Fertilizer and Lime

- 1. Apply to the vegetative layer by means of a mechanical spreader or other acceptable method which is capable of maintaining a uniform rate of application.
- 2. Conduct when the soil is in a moist condition.
- 3. Apply fertilizer and lime at a rate of 20 and 40 pounds per 1,000 square feet respectively.

### 3.03 SEEDING SEASONS

- A. Conduct permanent seeding between April 1 and June 1, between August 15 and September 10, or otherwise permitted. Temporary seeding shall be conducted no later than October 30.
- B. Do not seed during windy weather or when the ground is frozen, excessively wet, or otherwise untillable.

### 3.04 CARE AFTER SEEDING

Protect and care for seeded areas until final acceptance of the work, and repair any damage to seeded areas caused by pedestrian or vehicular traffic or other causes, at no additional cost to the Contract.

**\*\*\*END OF SECTION 02931 - SEEDING\*\*\***

**DIVISION 3**

**CONCRETE**

**SECTION 03300  
CAST-IN-PLACE CONCRETE**

**PART 1 - GENERAL**

**1.01 DESCRIPTION**

Furnish and install cast-in-place concrete shown on the Drawings, and specified herein.

**PART 2 - PRODUCTS**

**2.01 MATERIALS**

- A. Welded wire mesh: Welded plain cold-drawn steel wire fabric 6x6-W4xW4, ASTM A-185.
- B. Reinforcing bars shall be deformed billet-steel conforming to ASTM A615, Grade 60.
- C. Concrete: The design mix shall be so proportioned to produce normal-weight concrete consisting of portland cement, aggregate, air-entraining admixture and water to produce concrete for the following properties
  - 1. Compressive strength of 3000 psi, minimum at 28 days.
  - 2. Slump limit of three inches.
  - 3. Air content of five to eight percent.
- D. Subbase coarse of six inches of crusher run stone.
- E. Bonding Compound: Polyvinyl acetate or acrylic base, rewettable type.  
Available Products: Subject to compliance with requirements, products which may be incorporated in the work include, but are not limited to, the following:
  - 1. "J-40 Bonding Agent"; Dayton Superior Corp.
  - 2. "Weldcrete"; Larsen Products.
  - 3. "Intralok"; W.R. Meadows.
  - 4. "Everbond"; L&M Construction Chemicals.
  - 5. "EucoWeld"; Euclid Chemical Co.
- F. Liquid-Membrane Forming and Sealing Curing Compound: Comply with ASTM C 309, Type I, Class A unless another type is acceptable to the MMR CO or designee (COR). Moisture loss no more than 0.055 gr/sq. cm. when applied at 200 sq. ft./gal.  
Available Products: Subject to compliance with requirements, products which may be incorporated in the work include, but are not limited to, the following:
  - 1. "Masterseal"; Master Builders.
  - 2. "A-H 3 Way Sealer"; Anti-Hydro Waterproofing Co.
  - 3. "Ecocure"; Euclid Chemical Co.
  - 4. "Clear Seal"; A.C. Horn.

## PART 3 - EXECUTION

### 3.01 SURFACE PREPARATION

- A. Remove loose material from compacted subbase surface immediately before placing concrete.
- B. Proof-roll prepared subbase surface to check for unstable areas and need for additional compaction. Do not begin concrete placement until such conditions have been corrected and those surfaces are ready to receive concrete.

### 3.02 WELDED WIRE FABRIC AND REINFORCING BARS

Welded wire mesh and reinforcing bars shall be placed prior to placing concrete. Before being positioned, remove loose mill and rust scale and any coatings, including ice, that would destroy or reduce bond with the concrete.

### 3.03 CONCRETE PLACEMENT

- A. Do not place concrete until subbase has been checked for line and grade. Moisten subbase if required to provide a uniform dampened condition at time concrete is placed.
- B. Use bonding agent at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.

### 3.04 CONCRETE FINISHING

- A. After striking-off and consolidating concrete, smooth surface by screening and floating. Adjust floating to compact surface and produce uniform texture.
- B. After floating, test surface for trueness with a 10-ft. straightedge. Distribute concrete as required to remove surface irregularities, and refloat repaired areas to provide a continuous smooth finish.
- C. After completion of floating and when excess moisture or surface sheen has disappeared, complete troweling to finish inside surfaces and finish any outside surfaces with a broom finish by drawing a fine-hair broom across concrete surface perpendicular to line of traffic. Repeat operation, if required, to provide a fine line texture acceptable to the MMR CO or designee (COR).

### 3.05 CURING

Protect and cure finished concrete paving using membrane-forming curing and sealing compound or approved moist-curing methods.

### 3.06 PROTECTIONS

- A. Protect concrete from damage until acceptance of work. Exclude traffic from concrete for at least 14 days after placement. When construction traffic is permitted, maintain concrete as clean as possible by removing surface stains and spillage of materials as they occur.
- B. Sweep concrete concrete and wash free of stains, discolorations, dirt, and other foreign material just before final inspection.

**\*\*\* END OF SECTION 03300 - CAST IN PLACE CONCRETE \*\*\***

**DIVISION 10**  
**SPECIALTIES**

**SECTION 10523  
PORTABLE FIRE EXTINGUISHERS**

**PART 1 - GENERAL**

**1.01 DESCRIPTION**

Work includes: Furnish and install portable fire extinguishers in the Treatment Building as specified in this section.

**1.02 QUALITY CONTROL**

- A. Codes, Regulations, and Standards
  - 1. National Fire Protection Association
  - 2. Underwriters Laboratories, Inc.
- B. Manufacturers
  - 1. J. L. Industries
  - 2. Larsen
  - 3. Walter Kidde
  - 4. or approved equal.

**PART 2 - PRODUCTS**

**2.01 MATERIALS**

Multi-Purpose Dry Chemical Extinguishers

- 1. U.S. approved and rated for Class A, B, and C fires. DOT-ICC cylinder.
- 2. Heavy duty brass valve, one-hand squeeze grip operation, safety pull pin.
- 3. Pressure gauge.
- 4. Flexible discharge hose and nozzle.
- 5. Wall-mounting bracket.
- 6. Fully charged with multi-purpose "ABC" dry chemical and pressurized.
- 7. Stamped with hydrostatic test date.
- 8. Minimum sizes: Equipment room: Two 2-A:10-B:C extinguishers.



## PART 3 - EXECUTION

### 3.01 INSTALLATION

#### A. Mounting

1. Mount at accessible locations near exit door.
2. Attach mounting hook or bracket to wall with approved expansion shields or bolts.
3. Mount at heights in accordance with NFPA 10 regulations.

#### B. Identification

1. Provide wall markers in readily visible location above extinguishers.
2. Markers to be painted metal or decals complying with NFPA Standard No. 10 for fire classification of extinguisher.

#### C. Charging of Extinguishers

1. Deliver to project fully charged.
2. If discharged for any reason, refill at no additional cost to the Contract.

**\*\*\*END OF SECTION 10523 - PORTABLE FIRE EXTINGUISHERS\*\*\***

## SECTION 10600 PARTITIONS

### PART 1 - GENERAL

#### 1.01 DESCRIPTION

This section specifies the requirements for the partitions in the treatment building that separate the treatment room from the equipment room.

### PART 2 - PRODUCTS

#### 2.01 MATERIALS

- A. Gypsum Board: The gypsum board shall conform to ASTM C36 Type "X" and shall be 5/8 inch thick.
- B. Steel studs: The steel studs used in the fabrication of the partition shall be manufactured in accordance with ASTM C745. They shall be 25 gauge, shall be 6 inches in depth and shall be placed on 24 inch centers.
- C. The gypsum board shall be attached to the metal studs with using steel drill screws conforming to ASTM C-954.
- D. All galvanized studs and accessories shall have a minimum G-60 coating.

### PART 3 - EXECUTION

#### 3.01 SPECIFICATIONS

- A. Installation of the gypsum board shall conform to ASTM C-840 "Standard specification for the application and finishing of Gypsum Board." The steel drill screws used (ASTM-954) shall be spaced not more than 8 inches on center at the edges and ends of the gypsum boards, and not more that 12 inches on center, in the field of the board. The gypsum board shall be installed on both sides of the partition.
- B. The partitions shall extend to the bottom of the roofing panels of the treatment building.
- C. Connections of the metal studs shall be accomplished with self drilling screws or by welding. All steel bared by welding shall be touched-up using zinc-rich paint.
- D. The metal stud tracks shall be accurately aligned at both the top and bottom and fastened to the supporting structure. The Contractor shall supply any miscellaneous steel framing required to provide support for the top track. Track intersections shall butt evenly, where splicing of the track is necessary, a piece of track shall be placed

in the track and fastened with two screws or welds per flange. Metal studs shall be plumbed, aligned and securely attached to flanges or webs of the upper and lower tracks with two screws or welds per flange.

- E. Gypsum board shall be finished with a minimum of two coats of veneer plaster and shall be painted with two coats of off-white semigloss latex paint.

**\*\*\* END OF SECTION 10600 - PARTITIONS \*\*\***

**DIVISION 11**  
**EQUIPMENT**

## SECTION 11001 EQUIPMENT - GENERAL REQUIREMENTS

### PART 1 - GENERAL

#### 1.01 DESCRIPTION

- A. Every item of equipment shall be the product of a domestic manufacturer experienced in the design, construction, and operation of equipment for the purpose required, and who shall have furnished such equipment long enough to be able to show a record of successful operation.
- B. All parts and components of mechanical equipment shall be designed for satisfactory service under continuous duty without wear under the specified operating conditions.
- C. Any part of mechanical equipment that shows undue or excessive wear, or that fails under normal operating conditions during the operation of the air sparging/soil venting system shall be replaced with the equipment or parts to meet the specified requirements.
- D. All parts of mechanical equipment shall be amply proportioned for all stresses which may occur during operations, and for any additional stresses which may occur during fabrication and installation.
- E. Iron castings shall be tough, close-grained gray iron casting in accordance with ASTM A 48. Structural steel shall conform to ASTM A36.
- F. Mechanical equipment, including drives and electrical motors unless otherwise specified, shall meet the following requirements:
  - 1. Supply and fabricate in accordance with the Williams-Steiger Occupational Safety and Health Act of 1970 and subsequent amendments.
  - 2. The noise level of equipment, drives and motors, unless otherwise noted, shall not exceed 90 dba measured 3 feet from the unit under free field conditions.
  - 3. All rotating or moving parts shall have protective guards.

#### 1.02 QUALITY ASSURANCE

##### A. Standards

- 1. The applicable items of the following standards, codes or specifications shall apply:

|        |  |
|--------|--|
| AMCA   | Air Moving and Conditioning Association, Inc.                                |
| ASTM   | American Society for Testing Materials                                       |
| ASME   | American Society of Mechanical Engineers                                     |
| ANSI   | American National Standards Institute  |
| AGMA   | American Gear Manufacturers Association                                      |
| ASHRAE | American Society of Heating, Refrigerating and<br>Air Conditioning Engineers |
| AWS    | American Welding Society   |

|      |  |
|------|--|
| AWWA | American Water Works Association                 |
| IEEE | Institute of Electrical and Electronic Engineers |
| NBFU | National Board of Fire Underwriters              |
| NEMA | National Electrical Manufacturers Association    |

NOTE: Applicable federal government regulations also apply.

B. General Design of Equipment or Machinery

1. Furnish latest improved design suitable for the service specified.
2. Designed and constructed to operate efficiently, continuously and quietly under the specified requirements with a minimum of maintenance, renewals and repairs.
3. Fabricate to permit operation with minimum wear, vibration and noise when properly installed.
4. Provide ample room for erecting, repairing, inspecting and adjusting of all equipment and machinery.
5. Design, construction and installation shall comply with the latest safety codes and regulations.
6. All equipment selected shall suit the general arrangement of the space in which it is to be installed.
7. Drive units shall be furnished with driven equipment and be mounted and factory aligned including motors, shafts, couplings controls, wiring, and other required components.
8. All electrical equipment in the Equipment Room shall comply with the National Electrical Code requirements for equipment in Class I, Division 2 locations.
9. Special Tools: includes any type of tool that has been specially made for use on an item of equipment for assembly, disassembly, repair, or maintenance.
10. Electrical Work: unless otherwise specified in the mechanical equipment, all electrical work, materials, and equipment shall conform to the provisions of DIVISION 16 - ELECTRICAL.
11. Spare Parts
  - a. The Contractor is responsible for maintaining on site an adequate supply of spare parts so that the project schedule will not be impacted by normal equipment part failure.
  - b. Tag parts with equipment name and number, suppliers name, and part number.
  - c. Organize parts by equipment name and number and store where designated by the MMR CO.
  - d. Store parts as recommended by the manufacturers with regards to coating and corrosion and damage protection.
  - e. Maintain parts on site along with an adequate supply of equipment lubricant and filters as per manufacturer's recommendations.

### 1.03 SUBMITTALS

Catalog data, manufacturers specification, performance data, calculations, design criteria, and shop drawings, shall be submitted for review and approval by the MMR CO before equipment fabrication and assembly of the packaged system.

## PART 2 - PRODUCTS

### 2.01 MATERIALS

- A. Anchor Bolts and Bolts: The Contractor shall furnish all anchor bolts for all equipment; and shall be in accordance with manufacturer's specifications as to quality, number and location.
- B. Gaskets: Gaskets shall be suitable for the specified application and able to resist chemical corrosion in the combined air sparging/soil vapor extraction system.

## PART 3 - EXECUTION

### 3.01 INSTALLATION

- A. The contractor shall install equipment completely, prepare equipment for operation, operate, maintain, and lubricate all equipment.
- B. Welding is to be performed by electric arc and in accordance with applicable welding codes of AWS.

### 3.02 START-UP AND PERFORMANCE TEST

- A. Before startup of the air sparging or soil venting system, the interiors of piping, fittings, valves, equipment, and instrument boxes are required to be thoroughly cleaned by the contractor to remove any debris. Also a system tightness test is to be performed to locate leaks by pressurized air or vacuum. Any leaks identified during the tightness test shall be corrected by the Contractor.
- B. All instruments and controls shall be calibrated and finely adjusted by the Contractor. All safety devices, electrically driven motors, drives, parts, manual or interlock switches, etc., shall be tested before startup.
- C. All the required instruments, tools, special equipment, or other items for the startup and performance test shall be furnished by the contractor.
- D. Before planning the startup, the contractor shall make sure that all equipment, piping, instruments, foundation and supports are properly installed and that all the required utilities, such as electricity and propane are available and properly connected. The contractor shall verify that the pressure vessels were properly hydrostatic tested.
- E. All the required spare parts or items shall be available during the startup.

- F. All the applicable regulations, codes, ordinances, and guidance for environmental, safety, and transportation shall be complied during the startup.
- G. The contractor shall ensure the successful, safe, and reliable operation of the air sparging and soil venting systems and that the performance requirements are met. The contractor shall coordinate the required activities to ensure that the systems operations meet the general requirements, the applicable codes, regulations, ordinances, and the specific requirements of MMR CO or his designee (COR), and are capable of meeting the required remediation objectives.
- H. The contractor shall verify that the process conditions during system operation meet the general description in Section 11301 - Soil Vapor Extraction Systems and Section 11302 - Air Sparging System. If the system fails to meet the desired requirement during the startup or operation, the contractor shall provide all required actions to ensure that the system meets the requirements specified in this specification at no additional cost to the Government.
- I. The contractor shall coordinate the necessary field activities, including, but not limited to, process monitoring and operations, field sampling, personnel communication, personnel safety, emergency response, spill prevention, documentation and reporting, requirements.

**\*\*\* END OF SECTION 11001 - EQUIPMENT - GENERAL REQUIREMENTS \*\*\***



## SECTION 11301 SOIL VENTING SYSTEM

### PART 1 - GENERAL

#### 1.01 DESCRIPTION

- A. Furnish and install soil venting system and all appurtenances, as shown in the Drawings and as described herein.
- B. The soil venting system generally consists of the following units, as shown in Drawing ASSV-7:
  - 1. A preassembled air pollution control unit that includes a system blower and a catalytic oxidation unit.
  - 2. A propane storage and supply system for preheating air entering the catalytic oxidation unit.
  - 3. An underground piping system for conveying hydrocarbon-contaminated air from 21 soil venting wells to the air pollution control unit.
  - 4. An air/water separator upstream from the system blower.
  - 5. A wastewater treatment system for on-site treatment of contaminated water from the air/water separator.
  - 6. Continuous vapor monitoring of the feed and discharge air.

#### 1.02 SUBMITTALS

- A. Contractor shall obtain product data sheets describing the preassembled air pollution control unit and submit for approval by the MMR CO.
- B. Contractor shall obtain certified drawings and specifications of the propane storage and supply system, and submit for approval by the MMR CO.

### PART 2 - PRODUCTS

- 2.01 The underground piping system, air/water separator, and wastewater treatment system are described by the Sections referenced above.

#### 2.02 Air Pollution Control Unit (APCU)

General Description: The APCU shall process up to 3500 standard cubic feet per minute (scfm) of volatile organic compounds (VOC) laden air and provide at least 95 percent VOC-destruction efficiency. During system operation, VOC laden air shall be drawn from the soil venting wells by the system blower and diluted to the appropriate air mixture using a modulating valve. The blower shall discharge the contaminated air past an LEL monitor, a flame arrestor, and into the tube side of a primary heat exchanger where it shall be preheated prior to the gas burner. Within the burner/reactor section, if further heat shall

be needed, the contaminated air shall be raised to catalyzing temperature by a propane flame front prior to entering the catalyst modules. When the vapor laden air passes through the catalyst an exothermic reaction shall take place. The hot purified air then shall pass through the shell side of the heat exchanger where it shall preheat the incoming air. The cooler, vapor free air shall be finally exhausted to atmosphere.

A. Dilution Air Control

A series of modulating dampers and air dilution controls shall be supplied to dilute the inlet air stream during high VOC concentrations. The amount of dilution air shall be controlled by the exit temperature of the catalyst to keep the system operating within the desired temperature range.

B. System Blower

The system blower shall be a high performance blower with gas type seals. The vacuum blower shall be powered by a 460V/60HZ/3PH totally enclosed, fan cooled, high efficiency motor. Included shall be an airflow meter and a blower inlet filter. The blower shall be capable of developing a suction pressure of 30 inches water column at the blower inlet and an air flow rate of 3500SCFM.

C. Lower Explosive Level (LEL) Monitor

A solid state LEL sensor shall be installed at the outlet of the system blower. The LEL monitor shall terminate operation of the system at inlet concentrations of 25 percent LEL or above. The sensor shall be connected to a monitor mounted near the control panel.

D. Flame Arrestor

A metal grid type flame arrestor shall be supplied. The flame arrestor shall be placed between the system fan and heat exchanger inlet.

E. Burner/Gas Train

The gas train shall be fabricated to Factory Mutual/Industrial Research Institute (FM/IRI) specifications. The gas burner package shall be pre-piped, pre-wired and shall have a maximum firing rate of 1.5 MMBTU/hour. The burner shall be a propane gas type with an integral combustion air fan. The combustion fan shall utilize process air, when possible, instead of fresh air to keep the overall system size and operating cost to a minimum. The burner shall be mounted in the horizontal plane to allow the flame to fire in the direction of airflow. Uniform temperature entering the catalyst shall be achieved by proper air distribution over the burner and mixing plates located downstream of the burner. The burner shall be selected to bring the reactor up to catalyst ready temperature with ambient air during start-up. The burner shall have the capacity to maintain system operating temperatures during VOC free, full air flow conditions. The expected system heat-up time shall be approximately 30 minutes from a cold start.

F. Catalyst

The catalyst shall achieve at least 95 percent non-methane hydrocarbon (NMHC) destruction efficiency. The catalyst shall be positioned to maintain uniform airflow and temperature throughout the catalyst bed. The expected catalyst life shall be 30,000 hours of operation.

G. Heat Exchanger

A shell and tube heat exchanger shall be supplied to preheat the incoming air stream and reduce auxiliary fuel consumption. The heat exchanger shall be constructed of 304L series stainless steel and be continuously welded around all seams. Each weld shall be leak tested for assurance of no cross contamination. The VOC laden air shall pass through the tube side of the exchanger and the hot purified air shall pass through the shell side. The heat exchanger shall have a manual by-pass damper to prevent overheating of the reactor inlet air under high VOC loading conditions.

H. Exhaust Stack

An aluminized steel no-loss type exhaust stack with sampling ports shall be provided for mounting to the exhaust port flange. The stack discharge height shall be in compliance with applicable federal, state, and local regulations.

I. System Controls and Safety Shut-downs

The fully automatic controls of the system shall be divided into the following categories:

1. Start-up Controls
2. Burner and Flame Safety Supervision
3. Inlet and Outlet Temperature Controls
4. System Safety Shut-Down Controls

A PLC based control system with digital temperature controllers shall be supplied in a NEMA 4 enclosure. The control panel shall include a digital message center for status indication. A three-pen, hard copy recorder shall be supplied to monitor catalyst inlet and outlet temperatures as well as system airflow.

J. First-Out Shut-Down Detector

A shut-down detector shall be provided to indicate the cause of a system shut-down. A digital message center in the control panel shall provide a simple and convenient means of trouble shooting by providing a flashing message.

## 2.03 CONTINUOUS VAPOR MONITORING SYSTEM

General Description: The continuous vapor monitoring system shall be capable of monitoring feed and discharge air for organic vapors to assure adequate off-gas treatment system performance.

Periodic sampling and analysis of feed and discharge air shall be performed by an independent laboratory to verify adequate monitoring system performance. Feed and discharge air shall be sampled at least once a week during the first month of system operation, and at least once a month thereafter for the duration of the system operational period. All samples shall be analyzed for gross VOCs and ethylene dibromide (EDB) using EPA approved methods to ensure applicable air emission standards are satisfied.

## PART 3 - EXECUTION

### 3.01 INSTALLATION

- A. Contractor shall install equipment as shown in the Drawings and as directed in the specifications listed herein.
- B. Contractor shall balance airflows in the soil venting piping system by adjusting the ball-type valves at the wellheads and measuring the air velocity by inserting an air velocity meter at the location identified by Note 1 on Drawing ASSV-6. The nominal flow rate from each soil venting well shall be 150 SCFM.

**\*\*\*END OF SECTION 11301 - SOIL VENTING SYSTEM\*\*\***

## **SECTION 11302 AIR/WATER SEPARATORS**

### **PART 1 - GENERAL**

#### **1.01 DESCRIPTION**

The air/water separators will be used to remove water from the air stream before it goes to the blower and air pollution control unit.

#### **1.02 GENERAL REQUIREMENTS**

- A. The fabrication of the separator shall be in accordance with the Drawings.
- B. Vessel internals shall be free of dirt, grease, oil or loose items upon delivery.
- C. Vessel opening or nozzles shall be covered or protected during shipment.
- D. A name plate shall be secured to vessel to identify the manufacturer and the design pressure and temperature.
- E. Provide a sight-glass on the separator to observe the liquid level. The sight-glass shall be industrial duty and have a steel guard.
- F. Provide an intrinsically safe design level detection sensor. Provide an explosion proof high-high level alarm to warn of extreme high liquid level in tank and to stop operation of the soil vapor extraction system.
- G. The air/water separator shall be hydrostatically tested at 25 psig and ambient temperature.

### **PART 2 - PRODUCTS**

Not applicable to this section.

### **PART 3 - EXECUTION**

- A. The fabrication of the air/water separators and accessories shall be in accordance with the Drawings.
- B. A pressure/vacuum relief valve shall be included. The set point for the relief valve shall be 5 psig pressure and 50 inches water vacuum.

**\*\*\* END OF SECTION 11302 - AIR/WATER SEPARATORS \*\*\***

## SECTION 11303 AIR SPARGING SYSTEM

### PART 1 - GENERAL

#### 1.01 DESCRIPTION

- A. Furnish and install air sparging system and all appurtenances, as shown in the Drawings and as described herein.
- B. The air sparging system generally consists of:
  - 1. One compressed air system with appurtenances, as described in Section 15481 and the Drawings.
  - 2. An underground air distribution system that directs air to the five well groups.
  - 3. A sequencer/timer that allows air to flow to one of the well groups.
  - 4. Twenty-two air sparging wells and piping, as shown on the Drawings.
- C. During the initial operational period of the remediation system, only the soil venting system will be operated. Based on initial system performance and anticipated decrease in feed air organic vapor concentrations over time, the MMR CO or designee (COR) will direct the Contractor to begin operation of the air sparging system concurrently with the soil venting system.

#### 1.02 SUBMITTALS

Contractor shall obtain product data sheets describing the Flow Distribution Equipment (Section 2.02, below) and submit for approval by the MMR CO or designee (COR).

### PART 2 - PRODUCTS

- 2.01 Compressed air equipment, distribution piping, and wells are specified in the documents and Drawings referenced herein.

#### 2.02 FLOW DISTRIBUTION EQUIPMENT

##### Sequencer/Timer

- 1. Contractor shall furnish and install a sequencer/timer device to automatically direct the flow of compressed air to one of the five well groups by opening and closing valves in the five distribution subsystems. (The arrangement is shown schematically on the Drawings). In operation, all the air will flow to one well group for a preset amount of time, then switch to a second well group for the same amount of time, then to a third well group, and so on. After compressed air has been directed to each of the five well groups, the cycle will start over.
- 2. The Sequencer/Timer device shall include provisions that permit the operator to set the

- approximate amount of time (1 hour to 24 hours) that air will flow before switching the flow to a different well group.
3. The five valves in the distribution subsystems may be electrically-operated, air-operated, or mechanically-operated, depending on the type of sequencer/timer device furnished. In all cases, a valve will be either fully open or fully closed, not in a flow-modulating position.
  4. The five valves shall be no smaller than three inch iron pipe size.

## PART 3 - EXECUTION

### 3.01 INSTALLATION

- A. Install equipment as directed in specifications listed in Section 1.01, above.
- B. Perform an air pressure test as directed in Part 3, Compressed Air System, Section 15481.
- C. Demonstrate, in the presence of the MMR CO or designee (COR), a full cycle of operation of the Flow Distribution system.

**\*\*\*END OF SECTION 11303 - AIR SPARGING SYSTEM\*\*\***

## SECTION 11395 WASTEWATER TREATMENT SYSTEM

### PART 1 - GENERAL

#### 1.01 DESCRIPTION

Any entrained moisture in air from the soil vapor extraction operation will settle in the air/water separator. A pump will be used to transfer wastewater from the separator at a maximum of 10 gallons per minute (gpm) to activated carbon adsorption units for treatment. The liquid level switch in the air/water separator will control the pump operation, providing a high liquid level signal to automatically start the pump and a low level signal to stop the pump. When the liquid level in the tank reaches 50 percent (half full), the high level switch will automatically start the pump. When the liquid level reaches 60 percent, a high-high level alarm will sound to warn of an extreme high liquid level and will stop the soil vapor operation.

The contaminated wastewater from the extraction air is expected to contain benzene, toluene, ethylbenzene, xylenes (BTEX), and other petroleum hydrocarbons, as well as EDB. These contaminants will be removed by the activated carbon. The treated water will then be sent to a small recharge gallery, as shown on the Drawings. The spent contaminated carbon will be disposed at an approved site or regenerated by the Contractor.

#### 1.02 GENERAL REQUIREMENT

- A. The wastewater to the treatment system will be approximately 55°F, containing combined concentrations of BTEX, and other petroleum hydrocarbons, as well as EDB. The organic concentration in water is assumed to be the saturated solubility.
- B. The organic removal efficiency by the adsorption units is expected to be approximately 98 percent (Contractor to provide detailed information).
- C. The container for activated carbon shall be steel and have a volume of approximately 60 gals. It shall consist of one support plate and one hold down screen for carbon, so that the carbon will not be carried away by the water.
- D. The system shall consist of a pump maximum 10 gpm, two replaceable carbon adsorption beds in series, a water filter prior to the carbon beds, pressure gauges, polyvinyl chloride (PVC) piping, valves, fitting, and the support steel. A small water filter shall also be used to retain the fine carbon particles.
- E. Carbon Container Design
  - 1. Design pressure 25 psig, design temperature 200°F
  - 2. Meet ASME Section VIII, Div. 2 code
  - 3. Requires pressure certification stamp.



F. Pump Design

1. Pump starter to be three modes (1) automatic, (2) manual (with on/off), and (3) disconnect.
2. Design rate 10 gpm maximum.
3. Process wetted parts are to be Kynar, viton, or graphite.
4. Discharge head 20 psi (46 ft).

G. Contractor shall guarantee that the carbon units will meet the desired organic removal efficiency.

H. Upon system start-up and collection of the initial charge of water in the air/water separator, the Contractor shall test the organic removal efficiency before allowing automatic operation to begin. Contractor shall sample feed and discharge water and the intermediate sampling point between the two activated carbon filtration units and have laboratory analyses performed to verify the acceptable performance of the units. When laboratory analyses confirm that the system is performing within all applicable federal, state, Base, and local regulatory guidelines, automatic operation may begin.

I. The design and fabrication of the system shall comply with all the applicable requirements described in Division 11 and this specification.

J. The system shall be designed and fabricated in accordance with all federal, state, and local ordinances, codes, regulations, and guidance including, but not limited to, those of EPA.

K. During system operation, sampling and analysis of feed and discharge water will be required to verify adequate system performance. Feed and discharge water shall be sampled at least once every month during the operational period of the system. Feed and discharge water shall be analyzed for BTEX and EDB using EPA-approved methods, to verify adequate system performance and ensure discharge to the seepage pit is at or below applicable groundwater standards.

L. The shipping and transportation of the system shall be in accordance with US DOT regulations, and all other applicable regulations.

M. Provide a name plate to describe

1. Manufacturing serial number
2. Type of activated carbon
3. Equipment duty or capacity
4. Name of manufacturer

PART 2 -PRODUCTS

Not applicable to this Section.

PART 3 - EXECUTION

Not applicable to this Section.

**\*\*\*END OF SECTION 11395 - WASTEWATER TREATMENT SYSTEM\*\*\***

**DIVISION 13**  
**SPECIAL CONSTRUCTION**

## SECTION 13122 METAL BUILDING

### PART 1 - GENERAL

#### 1.01 DESCRIPTION

- A. Furnish all labor and materials and provide all operations in connection with the design, fabrication, delivery, and erection of a pre-engineered metal building at the location indicated on the drawings. Without limiting the generality of the work, major items include:
  - 1. Structural framing
  - 2. Metal siding and roofing, prefinished
  - 3. Trim shapes, flashing, gutters, leaders, caulking, and other accessories
  - 4. Flashing, trim and caulking for exterior louvers, vents, roof intakes, and all other penetrations through metal roofs and walls; include flashing and sealing at junction of metal wall panels and concrete walls and balusters.
  - 5. Foundation and anchor bolts
  - 6. Mechanical and electrical work
  - 7. Concrete work
  - 8. Doors
  - 9. Interior walls
- B. Coordinate work of this specification with that of the related work specified, and all other work of the project.

#### 1.02 QUALITY ASSURANCE

- A. Standards and Criteria
  - 1. Use the following standard and criteria (of most recent issue) where applicable in the structural design of the building covered by this specification.
    - a. "Recommended Design Practices Manual"; Metal Building Manufacturers Association (MBMA).
    - b. "Steel Construction Manual"; American Institute of Steel Construction (AISC).
    - c. "Cold Formed Steel Design Manual"; American Iron and Steel Institute (AISI).
    - d. "Aluminum Construction Manual"; The Aluminum Association (AA).
    - e. "Code for Welding in Building Construction"; American Welding Society (AWS).
  - 2. Criteria applicable in other phases of design
    - a. Basic Building Code (BOCA)
    - b. American National Standards Institute (ANSI-A58.1)
    - c. Structural Steel Painting Council - Standards (SSPC)

- d. American Society for Testing of Materials (ASTM) Standards
- 3. Ratings by
  - a. Underwriters' Laboratories, Inc. (UL)
  - b. Factory Mutual System
  - c. or other recognized testing laboratories
- B. Design Loads
  - 1. Basic design loads include dead, live, wind, snow, and seismic loads.
  - 2. Roof Loads
    - a. Roof equipment loading: 10 pounds per square foot (psf)
    - b. Roof live loading: 20 psf (min)
    - c. Roof snow loading (based on ANSI A58.1-1982)
      - Ground snow load: 30 psf
      - Exposure factor: C of 0.7
      - Thermal factor: 1.2
      - Importance factor: I of 1.0
      - Roof snow load: 20 psf (min)
  - 3. Wind Loads (Based on BOCA)
    - a. Basic wind speed: 100 mph
    - b. Exposure factor: C
    - c. Importance factor: I of 1.0
  - 4. Seismic Loads
    - a. Zone 2
    - b. Importance factor: I of 1.0
  - 5. All allowable stresses for working stress design may be increased one-third when considering wind or earthquake forces either acting alone or when combined with vertical loads. An increase will not be allowed for vertical loads acting alone.
  - 6. Combination of loads: The combining of loads for design purposes shall be as prescribed by the BOCA and ANSI A58.1.

### 1.03 SUBMITTALS

- A. Information to be submitted with bids
  - 1. General description of proposed building, including catalog pages and similar information as applicable.
- B. Submittals following award of contract
  - 1. Submit complete shop drawings for the pre-engineered metal building work, including all accessories, and show related work items in adequate detail. Submit to the MMR CO or designee (COR) for approval as soon as practicable after award of contract, but not more than three weeks after award, prior to fabrication.
  - 2. Submit engineering calculations for permanent record, bearing the stamp and signature of a Professional Engineer, registered in the Commonwealth of Massachusetts.

3. Submit complete erection drawings.
4. Consult with MMR CO or designee (COR) prior to delivery of samples to determine which, if any, are needed. Submit available metal colors for selection by MMR (for panels, trim, and accessories) if and as required by the MMR CO or designee (COR).
5. Certification: Letter from the metal building manufacturer certifying that the building proposed will be furnished to meet or exceed all specified design load criteria and that all structural design will be in strict conformance with that prescribed in the MBMA "Design Practices Manual" of recent issue, or as otherwise specified; with mention of each criteria specified.
6. Load information on the foundations and column baseplate sizes for design purposes.

#### 1.04 GUARANTEE

- A. Durability of the roof panels due to rupture, structural failure, or perforation, shall be guaranteed for a period of 20 years by the building manufacturer. A specimen copy of the document must be submitted after contract award, clearly stating the conditions under which the guarantee is valid.
- B. The interior and exterior (baked-on or laminated) finish for the wall panels shall be guaranteed by the building manufacturer for three years against blistering, peeling, cracking, flaking, checking, and chipping.

### PART 2 - PRODUCTS

#### 2.01 BUILDING SYSTEM (see Drawings)

- A. Type: Continuous beam structure, without center column support
- B. Roof type and slope: Double pitch, 2 inch in 12 inch
- C. Column base plates: Set on a 1 inch (+) grout bed and be not less than 3/4 inch thick, regardless of design calculations.
- D. Vertical diagonal bracing: Permitted only in the sidewall planes where service doors do not occur, or above the service doors.
- E. Horizontal plane bracing: Permitted providing it is above the building's required interior clear height.
- F. Roof purlins and wall girts shall be restrained laterally by steel sag rods. The side wall or roof covering shall not be considered as restraining the girts or purlins in their respective designs. Purlin and girt lateral restraining members may be of the manufacturer's standard shape.

## 2.02 ROOF COVERING AND SUPPORTS

- A. The roof construction shall carry a UL Construction (Uplift) classification of not less than Class 90.
- B. Roof Panels
  - 1. General
    - a. Roof system shall be insulated to achieve a minimum R-Factor of 20.
    - b. Exposed metal roof panel: 24-gauge (minimum) standing seam metal roof galvanized steel G90 coating.
    - c. Interior metal liner: nonacoustical, galvanized steel G90 coating; off-white color.
    - d. Full width panels required at all locations, including ends.
    - e. No field cutting of panels permitted, except for roof penetrations for mechanical and electrical equipment.
    - f. Visible straight panels at roof eave line and from ridge to eave.
  - 2. Deflection: Not greater than  $L/180$  of panel span at design vertical live loads.
  - 3. Seams
    - a. Standing seam interlocking design.
    - b. Factory applied non-hardening sealant.
    - c. Continuously locked and crimped together by mechanical means during erection.
    - d. Lap-type side (longitudinal) joints not permitted.
    - e. Staggered roof panel laps.
  - 4. Fastening system
    - a. Panels secured to panels with concealed fastening system.
    - b. Use concealed clip or backing device of steel having a protective metallic coating.
    - c. Allows roof covering to move independently of any differential thermal movement by structural framing system.
    - d. Except at concealed fastener, no thermal contact allowed between roof panels and supporting purlin.
    - e. Through penetration of roofing surface allowed only at terminal locations of panels.
    - f. Exposed fasteners (where allowed): Stainless steel, aluminum screws, bolts, or rivets with weather seal washers. Color of fastener heads shall match the roof panel finish.
- C. Purlins
  - 1. Thickness and spacing: Building manufacturer's standard provided all design criteria, including deflection, is met or exceeded. Bar joist shall not be permitted.
  - 2. Deflection: Less than  $L/180$  of its span when supporting the applicable vertical live loads.
  - 3. Galvanized or painted.

D. Roof Jacks and Curbs

1. Openings, eight inches or smaller
  - a. Flashed and sealed to the roof panel by jacks, which provide complete structural support and maintain weathertightness.
  - b. Material: Either metal with a protective metallic coating or plastic alloy with an acrylic film laminated to the exterior surface.
2. Openings, larger than eight inches, round or square
  - a. Frame with a welded metal base fabricated from .07-inch (minimum) thick aluminum or 16-gage (minimum) galvanized steel.
  - b. The base and its appurtenance: Support by the roof purlins and headers framing.
  - c. Base: Minimum projection of eight inches above weather surface of the roof, and match configuration of flanges with roof panel.
  - d. Flange-to-panel joint: Sealed with a nonhardening sealant and fastened in such a manner to provide complete support and weathertightness.
3. Integral component of the roofing system, designed and supplied by the roofing manufacturer.

2.03 METAL WALL COVERING AND SUPPORTS

A. Wall panels

1. General
  - a. Wall system shall be insulated to achieve a minimum R-factor of 13.
  - b. Metal curtain, exterior type, galvanized steel, 24 gauge minimum.
  - c. Interior metal liner: Nonacoustical, galvanized steel, 26 gauge minimum; off-white color.
  - d. Factory applied color coating.
  - e. Exterior color: Selected from the building manufacturer's standard.
  - f. Fire hazard rating: Equal to a Class 1 material as classified by Factory Mutual System.
  - g. Provide full width panels.
  - h. Field cutting: Not permitted except wall openings for windows, doors, and mechanical systems and then only if approved by building manufacturer.
  - i. Visible straight lines at base of panels.
2. Panel closures, flashings, fascias, gutters, leaders, and trim: Building manufacturer's standard, compatible with wall panels.
3. Seams: Interlocking, concealed or tongue and groove; lap seams not acceptable.
4. Fastening system
  - a. Use clips, screws, or bolts located on the inside of the panel or concealed in the joint.
  - b. For trim, fascias, gutters, and miscellaneous flashings: Exposed (non-load bearing) stainless steel or aluminum screws, bolts, and/or rivets.



Color of fastener heads shall match the wall panel finish.

B. Girts

1. Configuration and thickness: Building manufacturer's standard provided all design criteria, including deflection and girt spacing, is met.
2. Based on a simple span, the deflection of the girts (supporting the wall covering) shall be proportioned with due regard to the deflection produced by the previously prescribed design (wind) load.
3. Galvanized or painted.

C. Openings: Provide framing, flashing, sealant, and accessories for wall openings as shown on Drawings.

2.04 PAINTING

Submittals

1. Manufacturer's data
  - a. For information only, submit two copies of manufacturer's technical information including paint label analysis and application instruction for each material proposed for use.
  - b. Transmit a copy of each manufacturer's instruction to the paint applicator.
2. Samples  
Submit samples for MMR CO or designee's (COR) review of color and texture only. Compliance with all other requirements is the exclusive responsibility of the Contractor.

2.05 DOORS AND FRAMES

A. Fully insulated and weatherstripped.

B. Personnel Doors

1. Exterior
2. ANSI/SDI 100, Grade III
3. 16-gauge
4. 1-3/4 inch thick
5. Insulated R-factor of 10.0 or more

C. Frames

1. Exterior
2. ANSI/SDI 100
3. Welded corners

D. Finish Hardware

1. Hinges
  - a. nonremoveable pins
  - b. full mortise
2. Locks and latches
  - a. Best Lock Systems or equal

- b. Grade 1
- 3. Exit devices
  - a. Grade 1
  - b. Rim type

## 2.06 OVERHEAD DOOR

### A. Door Curtain Material and Construction

1. Fabricate coiling door curtain of interlocking slats designed to withstand the specified wind loading, of continuous length for the width of the door without splices.
2. Unless otherwise shown or specified, provide slats of the material gauge recommended by the door manufacturer for the size and type of door required, and as follows:
  - a. Steel Door Curtain Slats: Structural quality, cold-rolled, galvanized steel sheets complying with ASTM A446, Grade A, with 1.25 oz. "commercial" zinc coating, complying with ASTM A525, and phosphate treated before fabrication.
  - b. Endlocks: Heavy malleable iron castings, secured to curtain slats with two galvanized rivets, with locks on each curtain slat for curtain alignment and resistance against lateral movement.
  - c. Bottom Bar: Consisting of 2 angles, each not less than 1-1/2 inch x 1-1/2 inch x 1/8 inch thick.
3. Provide a replacement gasket of flexible vinyl or neoprene between angles as a weather seal and cushion bumper, unless shown as an overlapping joint.
4. Insulate with polystyrene foam insulation.

### B. Counterbalancing Mechanism

1. Description: Counterbalance door by means of an adjustable steel helical torsion spring, mounted around a steel shaft and mounted in a spring barrel and connected to the door curtain with the required barrel rings.
2. Bearings: Use grease-sealed ball bearings or self-lubricating graphite bearings for all rotating members.
3. Counterbalance Barrel:
  - a. Fabricate spring barrel of hot-formed structural quality carbon steel, welded or seamless pipe, of sufficient diameter and wall thickness to support the roll-up of curtain without distortion of slats and limit barrel deflection to not more than 0.03 inch per ft. of span under full load.
  - b. Provide spring balance of one or more oil-tempered, heat-treated steel helical torsion springs.
  - c. Size springs to counterbalance the weight of the curtain, with uniform adjustment accessible from outside barrel.
  - d. Provide cast steel barrel plugs to secure ends of springs to the barrel and the shaft.
  - e. Fabricate torsion rod for counterbalance shaft of case-hardened steel, of

- required size to hold the fixed spring ends and carry the torsional load.
4. Brackets: Provide mounting brackets of manufacturer's standard design, either cast iron or cold-rolled steel plate with bell-mounted guide groove for curtain.
  5. Hood:
    - a. Form to entirely enclose coiled curtain and operating mechanism at opening head.
    - b. Contour to suit end brackets to which hood is attached.
    - c. Roll and reinforce top and bottom edges for stiffness.
    - d. Provide closed ends for surface-mounted hoods, and any portion of between-jamb mounting projecting beyond wall face.
    - e. Provide intermediate support brackets as required to prevent sag.
    - f. Fabricate steel hoods for doors of not less than 24 gage hot-dip galvanized steel sheet with 1.25 oz. "commercial" zinc coating, complying with ASTM A525, and phosphate treat before fabrication.
  - C. Painting: Shop clean and prime all ferrous metal and galvanized surfaces, exposed and unexposed, except faying and lubricated surfaces, with door manufacturer's standard rust inhibitive primer drying to a flat sheen.
  - D. Manual Door Operator:
    1. Chain Hoist: Provide direct drive chain hoist, side-mounted unit consisting of an endless cadmium-plated alloy steel hand chain, cast iron pocket pulley and chain guard, mounted on counterbalance shaft as shown, and operating with not more than 35 pounds pull.

## PART 3 - EXECUTION

### 3.01 ERECTION

- A. Erect by one of the following
  1. Authorized dealers or builders of the manufacturer.
  2. Building manufacturer's crews.
  3. Other erectors authorized by the manufacturer as trained and qualified to erect that manufacturer's product. In this case, the manufacturer shall inspect the work and certify its correctness.
- B. Erect in accordance with reviewed shop drawings and erection drawings, and with manufacturer's recommendations.
  1. Follow manufacturer's recommendations regarding unloading, storage, and handling of materials.
  2. Prevent damage to factory finished materials.
- C. Erection tolerances: As set forth in AISC "Code of Standard Practice", except individual members will be considered plumb, level, and aligned if error does not exceed 1:300.

**\*\*\*END OF SECTION 13122 - METAL BUILDING\*\*\***

**DIVISION 15**  
**MECHANICAL**

## SECTION 15050 GENERAL MATERIAL AND WORK REQUIREMENTS

### PART 1 - GENERAL

#### 1.01 DESCRIPTION

##### A. Work Includes

The scope of work regarding the general material and work requirements for mechanical are described in Section 01010 and Division 11.

##### B. Nonexistent Conditions or Requirements

These specifications are general in scope and may contain provisions or requirements that are not applicable to this construction project. Any provision or requirement of this specification which pertains to a nonexistent condition or requirement shall have no meaning in the contract.

#### 1.02 QUALITY ASSURANCE

##### A. Pressure Vessels

Prior to installation and acceptance, any unfire pressure vessel operated at pressures of 15 pounds per square inch or greater, furnished under this contract will be stamped with ASME Boiler and Pressure Vessel Code Symbol and a National Board of Boiler and Pressure Vessel Inspector's number, thus certifying that the vessel has been fabricated and tested per the provisions of the ASME Boiler and Pressure Vessel Code. Manufacturer's data reports (unless exempted by the ASME Code) will be filed with the National Board. Testing, certification, and registration will be at the expense of the Contractor. Any pressure vessel operated above 15 psig utilized by the contractor to perform the work will be tested and certified before being used.

##### B. Welding

All welding on piping shall conform with the requirements of the American National Standard Code for Pressure Piping, ANSI B31.3, "Chemical Plant and Petroleum Refinery Piping." All welds on piping having working pressures of 300 psig or greater shall be subjected to a full X-ray examination and will not be accepted until all welds meet the requirements of ANSI B31.1, "Power Piping." Faulty welds shall be removed and repaired at no additional cost.

#### 1.03 REFERENCES

The current editions of the following standards are considered to be part of this specification.

##### A. American Standards Institute, ANSI

- B31.1, "Power Piping"
- B13.3, "Chemical Plant and Petroleum Refinery Piping"
- B. American Society of Mechanical Engineers, ASME "Boiler and Pressure Vessel Code"

## PART 2 - PRODUCTS

Not applicable to this Section.

## PART 3 - EXECUTION

### 3.01 INSTALLATION

#### General

1. The Contractor shall install equipment in strict accordance with the directions and recommendations furnished by the manufacturer. Where such directions are in conflict with the plans and specifications, the Contractor shall inform the MMR CO or designee (COR) of such conflict before proceeding with the work.
2. Foundations and Support Steels  
Concrete foundations and support steels for piping, materials, equipment, and packaged system shall be furnished by the contractor. All dimensions and exact locations for foundations shall be determined and located to suit equipment furnished. The Contractor shall be fully responsible for the foundations and supports and liable for any unsafe or inadequate design.
3. Alteration and Removal Work  
All alteration and removal work, when required or specified, shall be as specified in this specification or drawing and shall have a written permit from the MMR CO.
4. Cutting and Patching  
Cutting work installed by others shall not be done without prior approval. Where cutting becomes necessary, the Contractor shall employ the trade which originally installed the work to do the cutting and to restore such cut work. The cutting of structural members for the passage of piping or for hanger fastenings will not be permitted, except by prior written approval.
5. Protection of Materials and Equipment  
Pipe openings shall be closed with caps or plugs during installation when work is not in progress to prevent dirt, trash, animals, or other foreign matter from entering the piping. Equipment shall be tightly covered and protected against dirt, water, and chemical or mechanical injury. At completion of all work, the materials and equipment shall be thoroughly cleaned.

### 3.02 SCHEDULING AND COORDINATION

#### A. Interruption of Mechanical Utilities

The Contractor shall not interrupt any main interior or exterior mechanical utility without written request for an outage and a subsequent approval of the MMR CO and shall not interrupt any branch line to an outlet or item of equipment without verbal approval from the MMR CO.

1. Written request for outages shall be submitted seven days in advance of the outage date. This request will delineate the particular utility or service in question, the time the service will be interrupted and the approximate number of hours the utility shall be off.
2. Unless otherwise noted on the Drawings, or directed, any connections to existing utilities or equipment that necessitate interruptions of service shall be performed at a pre-scheduled time.
3. The work to be performed during the interruption, will be preceded by all possible preparation, and will be carefully coordinated to minimize the duration of the interruption and work will proceed continuously until the system is restored to normal.

#### B. Special Arrangements

The Contractor shall schedule delivery of all packaged systems or large equipment requiring special arrangements for installation.

### 3.03 ADJUSTMENT AND CLEANING

#### A. Shaft Alignment

All motors and pumps (or drivers) connected by a shaft coupling, whether factory or field assembled, shall be aligned during installation using a dial indicator applied to both ends of both shafts for a full 360 degrees prior to operation. Alignment of the shafts shall be less than the maximum allowable tolerances as recommended by the coupling or equipment manufacturer. Alignment of shafts shall be rechecked after several hours of operations when equipment has reached operating temperature.

#### B. Belts and Pulleys

The Contractor shall make any changes or replacements of pulleys and belts required for correct balance of the system.

#### C. Protection from Rotating Parts

All belts, pulleys, chains, gears, couplings, projecting setscrews, keys, and other rotating parts shall be fully enclosed or properly guarded.

#### D. Final Adjustments

The Contractor shall adjust all piping, instruments, equipment for proper operation, including calibration of all new control equipment, and existing equipment if required.

#### E. Cleaning

At the completion of the work, all parts of the installation shall be thoroughly cleaned. All equipment, pipe, valves, and fittings shall be cleaned of grease, metal,



cuttings, and sludge, which may have accumulated during installation and testing of the system.

#### 3.04 SPECIAL TOOLS

All special tools for the proper operation and maintenance of each system and major items of equipment shall be identified and stored in an acceptable location.

**\*\*\*END OF SECTION 15050 -  
GENERAL MATERIAL AND WORK REQUIREMENTS, MECHANICAL\*\*\***

## SECTION 15051 WELL AND PIPING SYSTEMS

### PART 1 - GENERAL

#### 1.01 DESCRIPTION

Materials and operations required for the installation of piping and piping systems for the air sparging and soil vapor extraction systems.

#### 1.02 QUALITY ASSURANCE

- A. Welding Materials and Procedures: Conform to ASME code for Pressure Piping, ANSI/ASME B31.
- B. Employ welders certified in accordance with ASME Section IX, as modified by ANSI/ASME B31, Pressure Piping.
- C. Brazing: Certify brazing procedures, brazers, and operators in accordance with ANSI/ASME B31 for shop and jobsite brazing of piping work.
- D. Soldering: Shall conform to Section 117 of ANSI/ASME B31.1, Power Piping.

### PART 2 - PRODUCTS

#### 2.01 MATERIALS FOR WELLS AND PVC PIPING AND VENTS

The PVC piping and fittings are used for the extraction air from wells to the air/water separator and also used for the condensed water treatment system.

- 1. Piping & Fitting  
All PVC piping and fittings shall be Schedule 40.
- 2. Well Screen  
The well screen shall be 304SS and will meet the requirements of ASTM A-304.

#### 2.02 MATERIALS FOR COMPRESSED AIR SYSTEMS (UNDER 125 PSIG)

- A. Piping  
2" thru 6" SCH. 40 ASTM A-53-B SML's
- B. Flanges  
2" thru 12" 150# RFWN (STD.B) ASTM A-105. ANSI B16.5
- C. Fittings  
2" and over STD. wt. butt weld F.S. ASTM A-234-WPB ANSI B16.9
- D. Gaskets  
All sizes 150# RF 1/8" THK non-asbestos
- E. Bolting

All sizes          ASTM A-307 GR. B HEX head bolts and nuts  
GAVL. elect. plated

F. Valves

1. Gate Valves  
2" and over          150# RF flanged C.S. gate valve
2. Globe Valves  
2" and over          150# RF flanged C.S. globe valve
3. Check Valves  
2" and over          150# RF flanged C.S. swing check valve
4. Ball Valves  
2" and over          150# RF flanged C.S. ball valve

2.03 MATERIALS FOR PROPANE GAS

A. Piping

- 1½" and under    SCH. 80 ASTM A-106-B SML's  
2" thru 6"          SCH. 40 ASTM A-53-B SML's

B. Fittings

- 1" and under    3000# F.S. screwed ASTM A-105  
ANSI B16.11  
1½" and over    STD. Wt. Butt Weld F.S. ASTM A234-WPB  
ANSI B16.9

C. Flanges

- 1" and under    150# RF screwed ASTM A-105, ANSI B16.5  
1½" thru 16"    150# RFWN (STD. B) ASTM A-105, ANSI B16.5

D. Gaskets          150# RF, 1/8" THK., non-asbestos for all sizes

E. Bolts and Nuts    ASTM A-307 GR. B HEX head bolts and nuts  
galv. elect. plated

F. Valves

1. Gate  
1" and under    600 lb. C.S. screwed gate valve  
1½" and over    150# RF flanged C.S. gate valve
2. Globe  
1½" and under    800 lb. forged steel screwed globe valve  
2" and over      150 lb. RF cast steel globe valve
3. Check  
1" and under    600 lb. C.S. screwed lift check valve  
1½" and over    150# RF flanged C.S. swing check valve
4. Ball  
2" and under    600# C.S. screwed ball valve  
3" and over      150# RF flanged C.S. ball valve

PART 3 - EXECUTION

- A. The locations of the proposed soil venting piping are shown on the Drawings. The Contractor will locate utilities and layout the locations of the wells and trenches before beginning pipeline installation.
- B. PVC pipe will be installed in accordance with the manufacturers recommendations. All pipelines shall be leak tested using compressed air or another method approved by the MMR CO.
- C. The soil venting pipelines and air sparging pipelines shall be installed with a minimum uniform grade (8 in. per 100 ft.) toward the wells.

**\*\*\*END OF SECTION 15051 - WELL AND PIPING SYSTEMS\*\*\***

**SECTION 15481  
COMPRESSED AIR SYSTEM**

**PART 1 - GENERAL**

**1.01 DESCRIPTION**

- A. Furnish and install compressed air system with all appurtenances where shown on the Drawings and as defined herein.
- B. The compressed air system generally consists of, but not necessarily limited to, the following:
  - 1. One base mounted air compressor
  - 2. One receiver
  - 3. Compressor controls
  - 4. Accessories

**1.02 QUALITY ASSURANCE**

Acceptable manufacturers

- 1. I-R Air Sales, a division of Ingersoll Rand
- 2. Quincy
- 3. Worthington
- 4. Atlas Copeo
- 5. or approved equal

**1.03 SUBMITTALS**

- A. Catalog data: Manufacturer's literature and illustrations
- B. Manufacturer's specifications and engineering data
- C. Performance data
- D. Shop drawings
- E. Operation and maintenance manuals

**PART 2 - PRODUCTS**

**2.01 DESIGN CONDITIONS**

|                            |                    |
|----------------------------|--------------------|
| Actual capacity            | 550 scfnc, nominal |
| Nominal operating pressure | 50 psig            |
| Receiver size (vertical)   | 400 gallons        |

## 2.02 MATERIALS

### A. Compressor

1. Oil-free rotary type, single stage, water cooled (closed loop)
2. Air intake filter/silencer
3. Integral base frame for compressor and driver
4. Driver and flexible coupling
5. Acoustical cabinet enclosure
6. Air pressure relief valve and discharge check valve
7. Instrument panel with gauges for
  - discharge air pressure
  - lubricating oil pressure
  - air filter intake vacuum
  - discharge air temperature
  - cooling water discharge temperature
8. Control panel with:
  - NEMA 12 enclosure
  - running time and loaded time hour meters
  - start/stop pushbutton
  - load/unload toggle switch
  - automatic shutdown for high oil temperature, low oil pressure, high discharge air temperature, and motor overload.

### B. Cooling system for closed loop compressor cooling water

1. Dry type
2. Approximately five (5) gpm fluid pump
3. 460/3/60 power
4. NEMA 12 control panel with motor starters for fans and pump, selector switch and thermostatic control for fans, and control transformer for 115/1/60.
5. Prewired unit, including gages, valves.

### C. Aftercooler/Separator

1. Capable of limiting compressed air temperature to 150°F.
2. Air cooled
3. Dual fans
4. Vibration-absorbing connection to compressor outlet piping
5. Condensate trap in aftercooler outlet piping, followed by centrifugal-type separator.

### D. Receiver Tank

1. 400-gallon, vertical
2. ASME certification nameplate
3. Pressure gauge; Safety valve

### E. Compressed Air Pressure Regulator

1. Outlet pressure gauge
2. Outlet pressure adjustable between 20 and 100 psig.
3. Sized for air flow rate of approximately 600 scfm.

## PART 3 - EXECUTION

### 3.01 INSTALLATION

- A. Install compressor package in accordance with manufacturer's requirements.
- B. Mount compressor receiver tank on vibration eliminator pads or rubber-in-shear mountings so as not to transmit noise to building structure.
- C. Install valved outlet.
- D. Clean all pipe and fittings prior to fabrication to remove dirt, oil and accumulated debris.
- E. Before ordering any materials or doing any work, verify all measurements concerning equipment and layout. No extra compensation will be allowed for differences between actual dimensions and those shown on the Drawings.

### 3.02 TESTING

- A. Perform an air pressure test on the entire piping system in the presence of the MMR CO or designee (COR).
- B. Fill system with air to 150 psig. System shall show no drop in pressure for a minimum of four hours.
- C. If system shows a drop in pressure, test all joints with a soap and water solution.
- D. Disassemble and remake all joints where leaking is found.
- E. Retest system until approved by the MMR CO or designee (COR).
- F. Contractor shall supply all required devices, pressure supply and gauges required for tests.

### 3.03 ADJUSTING

After system has been pressure tested and approved, bleed air from one of the valved outlets and set all pressure switches and controls to the satisfaction of the MMR CO or designee (COR).

### 3.04 SERVICE

When the equipment is capable of being operated, the equipment manufacturer shall furnish competent personnel for a period not to exceed two days to check the completed installation and instruct the Contractor's facility operators and MMR personnel in its use.

**\*\*\*END OF SECTION 15481 - COMPRESSED AIR SYSTEM\*\*\***

**DIVISION 16**  
**ELECTRICAL**



**SECTION 16001**  
**GENERAL REQUIREMENTS**

**PART 1 - GENERAL**

**1.01 DESCRIPTION**

- A. The work shall consist of obtaining an electric service permit, installing the electrical service and all the required electrical equipment, conduits, and components to provide power supply for operation of the air sparging and soil venting systems described in Section 11303 and 11301, respectively, as described in this specification.
- B. This section provides only the general requirements for procuring and installing the electrical service. The contractor shall be responsible to provide and install all the required electrical equipment and components to maintain a safe and reliable operation.
- C. The Contractor shall coordinate with COMElectric (local electric utility company) and the Base during design/installation of 3-phase power required for system operation. COMElectric will provide the following items required for the main system power supply:
  - Point of attachment at Route 130
  - New conductor from Route 130 to first pole on Base property
  - Step-down transformer
  - Local power meter

All utility poles on Base property are owned by the Base. Contractor shall coordinate with the Base concerning any structural modifications (bracing) to existing utility poles that may be required due to the addition of a conductor and associated insulators.

**1.02 GENERAL REQUIREMENTS**

- A. The electrical work shall be installed in accordance with the general specifications, the latest edition of the National Electrical Codes (NEC), local electrical and building codes, and other applicable codes. Should any conflict between specifications, codes, or rules exist, the more stringent one shall govern.
- B. The completed electrical work shall meet requirements of the Williams-Steiger Occupational Safety and Health Act of 1970, its subsequent amendments, and interpretations of the Act promulgated by OSHA of the Department of Labor.
- C. Electrical equipment furnished shall be Underwriter's Laboratories, Inc. (UL) listed and installation shall conform to UL standards, where applicable.
- D. The Contractor shall complete the work so that it will pass the tests by agencies

having authority over this work. The Contractor will also obtain and pay for all electric permits and certificates required by Federal, State, and local laws and ordinances.

- E. The electrical systems shall be grounded in accordance with Article 250, NEC and with local ordinances having jurisdiction. Bare copper conductors in each circuit will provide equipment grounding.
- F. The electrical system shall comply with National Fire Protection Association (NFPA) 70 and shall be designed so that all components operate within their capacities for initial and normal loads.
- G. All electrical equipment, components, devices, or control elements in the "Treatment Room" (Drawing ASSV-16) shall have the explosion proof design or intrinsically safe electrode elements.
- H. All metal parts of conduit, boxes, fittings, enclosures, hangers, straps, screws, etc., shall be made of or protected by corrosion-resistant materials.
- I. All electrical switches, control boxes, etc. shall be enclosed in NEMA 3R electrical enclosures unless the NEC requires more restrictive NEMA 7 enclosures.
- J. The complete electrical system shall be tested upon installation of all electrical equipment. This test will include all electrical equipment. This test will be structured to test the operation of all equipment and control relays.

## PART 2 - PRODUCTS

### 2.01 MATERIALS

- A. Conduits shall be rigid, metal or PVC with fittings designed for the conduit's particular application. Electrical connections to pumps, level switches, and other similar equipment shall be made using no more than 5 feet of flexible conduit. All electrical wiring will be installed in conduit, unless otherwise approved by the MMR CO or designee (COR). Conduit shall conform to the requirements of UL Standard UL 6-76 and be sized in accordance with the NEC.
- B. Conductors shall be 600 volt type THHN copper. Use solid copper for branch circuit wiring #10 and smaller. No conductor for branch circuit wiring shall be smaller than #12, except where supplied by equipment manufacturer as motor or switch leads.
- C. Duplex, weatherproof, grounding receptacles shall be rated for 15 amperes, 120 volts. These receptacles shall be installed in an FS or FD cast box with a gasketed, double-flap cover in accordance with NEC 410-57(b).
- D. Disconnect switches and panels shall be 200 amp, NEMA 3R, unless otherwise specified on Drawings. The interrupting capacity of all breakers shall exceed the available fault current.

### PART 3 - EXECUTION

3.01 The Contractor shall supply all necessary electrical components.

3.02 Any underground conduits shall be buried a minimum of 24 inches below the existing ground surface.

#### 3.03 INSTALLATION OF CONDUIT

- A. Install conduit to avoid trapping moisture and with as few bends as practicable.
- B. For bends made in the field, use a radius of not less than that allowed in Section 346.10 of NEC. Keep bends free from dents and flattening. Use no more than the equivalent of 4 bends of 90 degrees between any two outlets, counting bends at outlets. Do not heat metal conduit.
- C. Where conduit enters or leaves cabinets and boxes, use standard locknuts on the outside of the box and a locknut and bushing on the inside.
- D. Conduit shall be continuous from outlet or cabinet, with no wires spliced in conduit, and shall be secured to the building structure. Stuff boxes and cork fittings to prevent the entrance of water during construction prior to completion of conduit installations.
- E. Support conduit vertically and horizontally in accordance with NEC Article 346-12. Do not exceed these intervals:
  - ½ inch and ¾ inch conduit 5 feet
  - 1 inch through 1-½ inch conduit 7 feet
  - 2 inches and larger conduit 10 feet
- F. Install a yellow, plastic, detectable, magnetic, 6-inch wide tape 8 inches below-grade and above all underground conduit or duct lines. Tape shall be printed continuously with "Electrical Line", or equal.
- G. Run exposed conduit parallel to, or at right angles with, the lines of the structure. When exposed, make right angle bends with standard conduit elbows by bending conduit.
- H. Exercise particular care in cutting conduit to the proper length in order to ensure that the ends fit exactly in outlet boxes, couplings, and cabinets.
- I. Support exposed conduit work with hot dip galvanized steel clamps, straps, or pipe hangers.
- J. For pulling wire use soapstone, Yellow 77, or equal.

#### 3.03 INSTALLATION OF ELECTRIC BOXES

- A. All disconnects, receptacles, main panels, and equipment control boxes shall be installed in compliance with NEC requirements. Where applicable, electrical equipment will be installed in accordance with Article 500 of the NEC for a Class 1, Division 1 location.
- B. All electrical boxes and panels will be securely fastened.

- C. Circuit breakers shall be thermal-magnetic molded case-type and shall indicate "on", "off", and "tripped" positions on the operating handle. The Contractor will provide all required circuit breakers and fuses. Ground fault interrupters shall be provided for receptacle circuits.

**\*\*\* END OF SECTION 16001 - ELECTRICAL - GENERAL REQUIREMENTS \*\*\***

## SECTION 16002 POWER SUPPLY

### PART 1 - GENERAL

#### 1.01 DESCRIPTION

- A. Contractor shall be responsible for providing 460 volt, three-phase electrical power at the project site, and for making all connections and provisions necessary to enable operation of the equipment described in the Drawings and Specifications. The work shall include upgrading the transmission lines from the site to the power source.
- B. This section pertains to general requirements for providing the power supply. The contractor shall be responsible for procurement and installation of electrical equipment and components to maintain safe and dependable operation.
- C. All work shall meet acceptance requirements of the power supplier, Commonwealth Electric Company (COMElectric), and shall comply with provisions of the National Electrical Safety Code, ANSI C2-1993.

#### 1.02 GENERAL REQUIREMENTS

- A. The existing power distribution system consists of two conductors carrying single-phase power from a COMElectric transformer located at the intersection of Route 130 and Wood Road. Contractor shall retain the two existing conductors and shall furnish and install a third conductor and a neutral line, approximately 5,000 feet long, to carry 3-phase power to the site. The new conductor shall be sized for 8320 volts.
- B. Transmission lines and neutral wire shall be supported by existing poles along Wood Road and Greenway Road. As shown in Drawing ASSV-19, there are approximately 42 poles, all of which are owned by the U.S. Government. Contractor shall replace all wooden crossarms and insulators on existing poles.
- C. The new conductor and neutral wire lines shall terminate at step-down 460-volt transformers mounted on a new pole located near the Equipment Building, as shown in Drawing ASSV-19. Contractor shall be responsible for installation of service drop and final connection of power to the main disconnect switch in the Equipment Building.
- D. In all phases of the work, the contractor shall work in close cooperation and consultation with COMElectric to assure compliance with COMElectric acceptability standards for privately owned systems. This includes features such as conductor size, conductor separation, conductor height above ground, insulators, grounding, connectors, overcurrent protection, and bracing of pole for step-down transformers.

#### 1.03 SUBMITTALS

Contractor shall prepare shop drawings of the upgraded power supply system, showing

principal dimensions, connections, wiring details, and specifications of purchased items. Contractor shall submit the drawings and specifications to COMElectric for comments, and to the MMR CO or designee (COR) for approval before proceeding.

## PART 2 - PRODUCTS

### 2.01 MATERIALS

- A. The wiring for the new hot line and new neutral line shall be 1/0 bare aluminum wire.
- B. The new pole (No. 66A) to be installed next to the Equipment Building shall be 40 feet long and shall be set at least six feet into the ground.

## PART 3 - EXECUTION

- 3.01 Contractor shall supply all necessary electrical components except the three step-down transformers, which will be supplied by COMElectric.
- 3.02 Contractor shall be responsible for all costs associated with the power supply system, including charges by COMElectric.
- 3.03 Contractor shall be responsible for clearing brush beneath the transmission lines, and for side trim and overhead within eight feet from any transmission line.
- 3.04 Contractor shall inspect and tighten and/or replace any defective guy wires.
- 3.05 COMElectric will provide changes to or upgrades to transformers for other users of power from the distribution system.
- 3.06 Contractor shall ensure that power is maintained to all on-line users during the transmission line upgrade.
- 3.07 Contractor shall inspect existing poles to ensure that they are sound and capable of supporting the additional two lines.

**\*\*\*END OF SECTION 16002 - POWER SUPPLY\*\*\***

**SECTION 16710  
COMMUNICATIONS SYSTEMS**

**PART 1 - GENERAL**

**1.01 DESCRIPTION**

Work Includes

- A. Make all arrangements with the telephone company for installation of private line telephone service.
- B. Be responsible for monthly service and toll charges incurred until completion of the project and acceptance by the Contracting Officer.

**1.02 QUALITY ASSURANCE**

The installation shall comply with all federal, state, and local laws and provisions of the telephone company, and the Base telephone system.

**1.03 SUBMITTALS**

- A. Catalog data: Manufacturer's literature and illustrations.
- B. Manufacturer's specifications and engineering data.
- C. Performance data.
- D. Shop drawings.
- E. Operation and maintenance manuals.

**PART 2 - PRODUCTS**

**2.01 TELEPHONE SERVICE**

- A. Lines
  - 1. Underground from nearest utility pole through PVC conduit.
  - 2. Surface cover: two feet
- B. Telephones: one wall-type telephone.

**PART 3 - EXECUTION**

**3.01 INSTALLATION**

Install as shown on the Drawings.

**\*\*\* END OF SECTION 16710 - COMMUNICATIONS SYSTEMS \*\*\***



## SECTION 16721 FIRE ALARM SYSTEM

### PART 1 - GENERAL

#### 1.01 DESCRIPTION

- A. Contractor shall obtain and install a fire detection system in accordance with the manufacturer's instructions, and shall make arrangements for round-the-clock monitoring of the system at the vendor's nearest customer monitoring center.
- B. Contractor shall obtain from the MMR CO or designee (COR) the names and telephone numbers of the persons to be notified by the customer monitoring center in case of fire detection, and shall notify the director of the monitoring center accordingly. The monitoring center shall be responsible for contacting the assigned government and contractor points-of-contact in case of fire detection.
- C. Contractor shall be responsible for all monitoring costs incurred until completion of the project and acceptance by the Contracting Officer.

#### 1.02 ACCEPTABLE MANUFACTURERS

ADT Systems, Associated Alarms, Inc., or approved equal.

#### 1.03 SUBMITTALS

- A. Catalog data
- B. Manufacturer's specifications and engineering data
- C. Performance data
- D. Shop drawings
- E. Operations and maintenance manuals

### PART 2 - PRODUCTS

#### 2.01 GENERAL

- A. Equip the building with an alarm system to provide early indication of incipient fire conditions.
- B. On sensing an alarm condition, the system shall transmit a notification to the vendor's nearest monitoring center, and shall sound an alarm located outside the building.

## 2.02 EQUIPMENT

- A. Central control station mounted in the building to monitor the sensors and furnish alarm outputs at the onset of alarm conditions.
- B. Provide two UV smoke detection sensors, one in the treatment room and one in the equipment room. The smoke detectors shall input to a control panel. The panel shall provide outputs to the fire alarm and the monitoring center.
- C. The system shall include all control circuitry, power supplies, battery back-up and accessory equipment required for functioning to specification, including an operating keypad that provides operating instructions.

## PART 3 - EXECUTION

### 3.01 INSTALLATION

- A. Installation and placement of sensors shall be per the manufacturer's layout. Final wiring connections shall be made under the direct supervision of a representative of the equipment manufacturer.
- B. The complete system shall meet U.L. requirements. All wiring to be in approved conduit and shall meet the requirements of applicable local, state, and national codes, and the Base requirements.

**\*\*\* END OF SECTION 16721 - FIRE ALARM SYSTEM \*\*\***

**SECTION 16723**  
**SECURITY ALARM SYSTEM**

**PART 1 - GENERAL**

**1.01 DESCRIPTION**

- A. Contractor shall obtain and install an unauthorized entry detection and alarm system in accordance with the manufacturer's instructions, and shall make arrangements for round-the-clock monitoring of the system at the vendor's nearest customer monitoring center.
- B. Contractor shall obtain from the MMR CO or designee (COR) the names and telephone numbers of the persons to be notified by the customer monitoring center in case of unauthorized entry detection, and shall notify the director of the monitoring center accordingly. The monitoring center shall be responsible for contacting the assigned government and contractor points-of-contact in case of a security breach.
- C. Contractor shall be responsible for all monitoring costs incurred until completion of the project and acceptance by the Contracting Officer.

**1.02 ACCEPTABLE MANUFACTURERS**

ADT Systems, Associated Alarms, Inc., or approved equal.

**1.03 SUBMITTALS**

- A. Catalog data.
- B. Manufacturer's specifications and engineering data.
- C. Performance data.
- D. Shop Drawings.
- E. Operations and maintenance manual.

**PART 2 - PRODUCTS**

**2.01 GENERAL**

- A. Equip the building with an alarm system to provide indication of unauthorized entry.
- B. On sensing an alarm condition, the system shall transmit a notification to the vendor's nearest monitoring center, and shall sound an alarm located outside the building.

## 2.02 EQUIPMENT

System shall include a control panel mounted in the building and all required door sensors and an enable/disable keypad, preferably the same keypad that operates the fire alarm system (Section 16721).

## PART 3 - EXECUTION

### 3.01 INSTALLATION

- A. Install per manufacturer's recommendations and as shown on the Drawings. Final wiring connections shall be made under the direct supervision of a representative of the equipment manufacturer.
- B. Installations shall meet U.L. requirements and all applicable codes. All wiring to be in approved conduit and shall meet the requirements of applicable local, state, and national codes, and the Base requirements.

**\*\*\* END OF SECTION 16723 - SECURITY ALARM SYSTEM \*\*\***